..THE IRON AGE..

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MARKET ANALYSIS IS FIRST REQUISITE IN NEW ERA OF SELLING

By CHARLES F. ABBOTT
Executive Director, American Institute of Steel Construction, Inc.

PRESENT-DAY thought tends toward problems of merchandising, of marketing. The first requisite in the new era of selling, says the author, is market analysis. Today, manufacturers must consult the whims of the consuming public. Organized research is necessary to develop the trends of future markets. Success will come chiefly to those companies that keep in touch with modern tempo. If production is to be increased and our production problem solved, manufacturers must meet the consumer and understand the new buying tendencies.

COMMODITY prices have declined radically during the past year or two. Today, in some countries, basic prices are below what they were in 1913, and in the United States generally we have gone back to a pre-war basis of values. This has disrupted all invested values and jeopardized the ability of debtors to repay in full the money they borrowed when values were higher. This situation has been due in no small measure to the universal practice of business executives to resort to barter during the period of the decline. But just because we have been victims of a universal practice is no assurance that we are going to work our way out of the morass of distress by the same methods.

The first requisite is a market analysis. The immediate problem before sales organizations today is to apply intensive study to their markets. If consumption is to be increased and our production problem solved, we must start at once to meet the consumer and understand his buying tendencies, his desires or wishes. We must assemble the facts if we are to build safely.

Market analysis will be vigorously applied in the future. The location and listing of all possible users, reasons why sales are not made, the attitude of prospects toward the product and the company, and other selling influences should be recorded and prepared for sales planning. It is far more important to know what a business is not doing but might do than to know what is being done. It is the business that is not being obtained that should receive serious attention.

Market Analysis Substitutes Knowledge for Guesswork

Market analysis keeps the pertinent facts before the sales executive and enables him to guide his forces intelligently

and effectively. It is substituting knowledge for guesswork and assumptions. It records the activities of competition and opens the way for a program to extend the present existing market by selling those who previously have not been buying. It also opens the way for more sales to present customers as more knowledge of their possibilities is obtained. Sales promotion, advertising and sales direction, policies and plans are first based upon the facts produced by market analysis.

Of even greater service is the possibility of predicting trends of consumption, tabulating the changing whims and fancies of a fickle public as a means of stabilizing the fluctuations of business. A more complete and accurate knowledge of consumption and all the forces that influence it is indispensable for accurate planning.

This is an engineering age and an age when change is the accepted order of the day. We no longer live in the sluggish economic age which existed 50 or more years ago, when consumers fought stubbornly against their own advancement. How many know that, when bathtubs were first introduced, the prejudice and opposition was so great that laws were passed forbidding people to take baths in them for reasons of "public health"? How many know that the newly-invented telephone, when exhibited at the Centennial Exposition in 1876, attracted very little attention, while large crowds hung around the booth where there was displayed a statue of a man carved out of butter? How many know that 15 years after the typewriter was invented salesmen were still being kicked out of business offices for daring to make the terrible suggestion that business firms

typewrite their letters? Business men thought typewritten letters would insult their customers!

In those days it was the consumer who was backward, and the manufacturer was the dictator. But this condition has all been changed. Millions of people go to automobile shows, to radio shows, and to stores, and then read magazines eagerly to get acquainted with the latest goods.

Woman's Influence Today Sways Consumer Demand

Today the consuming public is swayed by the influence of the woman who is alert and up to date. We had a fine demonstration of this influence when the scientists discovered that calves' liver contains a large amount of vitamins. Within one week after that announcement the women in New York raided the meat shops, and you had to reserve your liver almost as far in advance as you now do tickets to a big Broadway theatrical hit. Mrs. Consumer had "snapped in" the moment she discovered that there was a new scientific advantage available to her.

Woman is teaching us that if we are to have prosperity we must inject beauty into mass production. We must remake our tin-lizzy world into an artistic world, a world of color and style and convenience, comfort and even luxury. A day is approaching when the things we will turn out of our factories will have the beauty of those in the days of handicraft. Our buildings and bridges will no

longer be eyesores, but combinations of service, economy and beauty.

Most of us forget that approximately eleven million new families—new homes—have been started since the Great War. In other words, not far from half the homes of this country are operated today by young women who have been married since 1920. They are the younger generation with new and more modern ideas; and with a determined, intelligent, educated, independent outlook on life, such as we did not know before the war. They are the most critical, the most sophisticated body of consumers that American business has had to face, and what they say goes.

Modern consumers are no longer docile, old-fashioned, uneducated, contented or stupidly stubborn. As often as not they "beat you to it." If the independent retailer does not, the alert chain store will; and if one manufacturer does not, another will. The competition today is for the consumer's favor, for consumer acceptance and prestige.

Industry Must Be Ready to Meet Whims of the Consumer

Important changes happen in twenty-four hours; big successes are sometimes made in a few months. Serious upsets come almost overnight—all because business today must be consumption-minded, not merely production-minded. It must be ready to meet the consumer's bidding.

At one time in American business history we thought it was a great thing to manufacture something and then push and fight for years to put it over against overwhelming odds. We held up examples of final success in such efforts as wonderful achievements. But we never checked up to find out how many thousands of other businesses failed in trying to put over goods which consumers did not want.

To every success there were probably five thousand failures. This is because most of these corporations are not fitted to their market either in merchandise,

selling or price policies. They do not acknowledge the consumer as supreme. Instead, many are still trying to drive the consumer. They are trying to sell unwanted merchandise; or sell at uneconomic prices.

Possibly one-half the merchandise sold today requires too much wasteful effort to sell, costs too much money to distribute, is too high in price; or is competing on price alone, which is a most ruinous policy. Why too much effort to sell? Simply because the merchandise was not tailor-made, to the consumer's preferences, or because the consumer's ideas were not previously prepared for its acceptance. It is unwanted merchandise; goods unfitted for consumption.

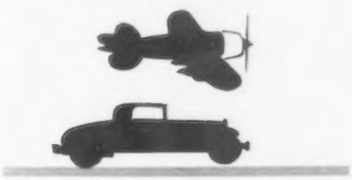
The Government discovered in its Louisville survey of retail trades that stores were still offering for sale cans of food from factories that had been

out of business for six years! Many of these stores were merchandise cemeteries. Row upon row of dead merchandise on the shelves, like so many tombstones. There are thousands like them everywhere, and there are many more thousands of offices and factories that are nothing more than equipment museums.

To attempt to run counter to the consumer's wants is to invite disaster. That accounts for the greater proportion of the distribution wastes that have been hampering business. It is estimated that 54 per cent of the bankruptcies result from a lack of intelligence. And in the last analysis intelligence consists mainly in knowing what the public wants to buy, and applying that knowledge.

Buying Power Will Increase With Greater Consumption

We must prepare ourselves for a great consumption era. We are going to increase the per capita wealth and buying power of this nation far beyond the record figures of today. The big tool will be a



closer adaptation of manufacture and distribution to the consumer.

It is a far cry indeed from the old principle of "the public be damned." Just as we have overthrown the old emperors and autocratic rulers of the people to let the people rule, so in business the consumer has arisen and the old order is dead and gone.

If an industry actually knew of the opportunities for a greater use of its product, of the waste that occurs in failing to develop new uses and new markets, and the loss in profits that could readily be realized, it would immediately insist upon organized research. Courageous spending, it is true, but why should so much courage be needed when the results are so obviously profitable?

We know for a certainty that our structural steel consumption might have been increased tremendously. As a matter of fact, it has been increased nearly three times in volume since the World War. It is possible today to increase it 50 per cent more by properly promoting the markets which we know are possible. This, however, would require greater concert of selling methods and a more scientific approach to the market problems.

Similarly, relief could undoubtedly be found for the other branches of the steel industry if proper attention were devoted to a study of present markets, combined with the application of research to promote new uses.

The chromium and other alloy steels, but recently perfected, are in line with the development of markets. From automobiles, airplanes, mechanical devices, buildings, to kitchen utensils and a host of other uses, these new steels have found acceptance.

The battledeck steel floor, armor steel highway guard, steel dams, and other new uses have also been developed as a result of research. These new markets, once developed, would bring to the steel industry millions of tons of new demand that would go a long way toward absorbing any excess capacities that may exist.

It would be interesting to know just what plans are being formulated by sales managers to analyze

these new markets and arrange for efficient distribution. Advertising, sales promotion and salesmanship are the tools necessary to fully realize on these vast possibilities.

Keep in Step with Modern Tempo Is Rule for Success

Inability of business executives fully to appreciate the problems of distribution, to have any known yardstick whereby to measure market possibilities, lacking any scientific approach to the control of marketing costs, constitutes the basis of this problem.

Opportunities for profitable business will escape those who fail to take full advantage of the possibilities that are offered. Success will never come to the man who refuses to keep in time with this modern tempo. Nothing is so detrimental to a growing business as the failure to spend an amount equal to the tasks set for the spender.

The industry which grasps the full meaning of

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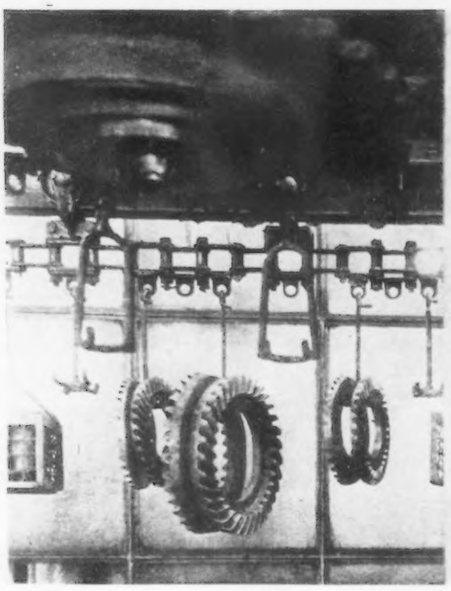


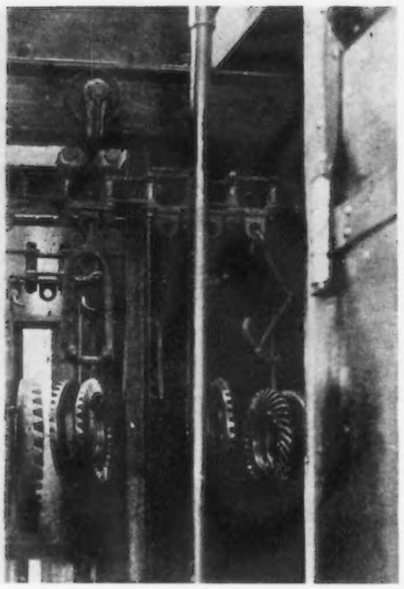
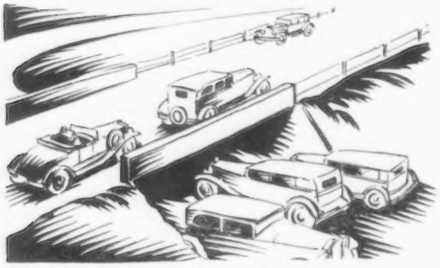


FIG. 13.—Most carburized parts are drawn in air furnaces instead of in oil or salt baths. The conveyor mechanism is a feature.



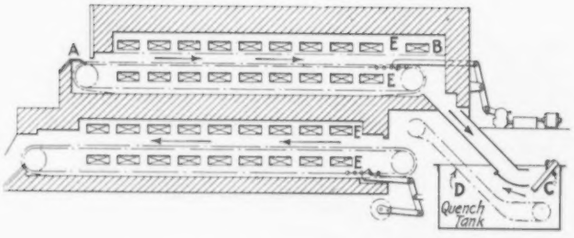


FIG. 15.—A double-deck electric hardening and draw furnace for steering spindles. Hardening chamber is above. Furnace hearth is 22 ft. long.

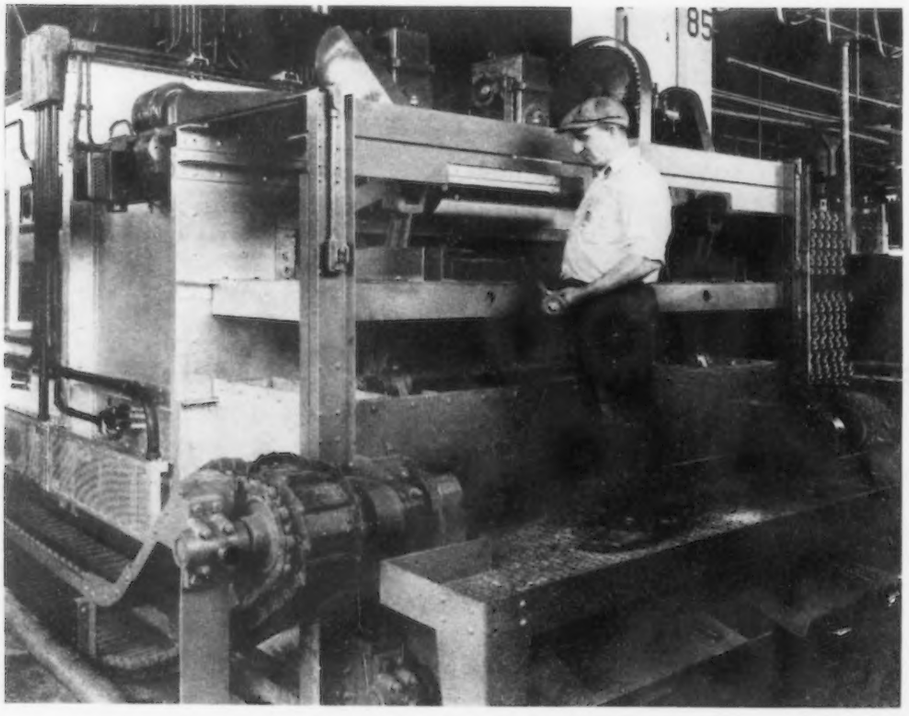
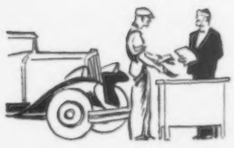


FIG. 14.—Rear axle drive shafts for passenger cars and trucks are hardened in double-deck furnaces. The hardening chamber above is 24¾ ft. long; the draw chamber is below.



ELECTRICITY USED ON A LARGE SCALE FOR HEAT TREATING

By GLENN COLEY
Detroit Edison Co., Detroit

IN the first portion of this article, in THE IRON AGE of Sept. 10, the use of electricity for forging and for heat treating by the Ford organization was described. In this, the concluding section, besides a continuation of the description of the heat-treating furnaces, there is a brief discussion of how pig iron from the blast furnaces and cupolas is duplexed with electric furnaces for making iron castings.

MOST carburized parts are drawn in air furnaces instead of oil or salt baths. One of these furnaces with the conveyor mechanism is shown in Fig. 13. It is 94 ft. long and has four rows of work passing through it. The rows alternate in opposite directions to obtain savings from the counterflow effect. Ring gears and similar parts are loaded directly on the hooks, while smaller parts are loaded in wire baskets.

Rear axle drive shafts for both passenger cars and trucks are hardened in double-deck furnaces (Fig. 14). Two furnaces are used on model A shafts and one on truck shafts. They have the hardening chamber above and the draw chamber below. The upper chamber is 24¾ ft. long, 1 ft. high and 6 ft. 5 in. wide, and has three control zones with 585 kw. connected. It takes two rows of shafts which are pushed through on shoes riding in grooved rails. The shoes are automatically returned to the charging end by means of a conveyor. Shafts are removed by hand and placed in a quenching fixture of the spinning type. After this the spinning machine fixture, with the shaft, is rotated through 90 deg., quenching the shaft.

After removal from the quenching bath, shafts are put in the draw chambers below. These are of approximately the same size as the ones above, except the draw furnace is divided into two separate chambers about 3¼ ft. wide. The chambers are divided into six control zones with 198 kw. connected for each chamber. Shafts are carried through on chains. The draw chambers are unique in that they operate at three different temperatures across their width to give three hardnesses on the shafts. The gear end of the shaft is drawn to give a hardness of about 512 Brinell, the center has a hardness of 477, while the taper end has a Brinell of 340. These furnaces have a capacity of 400 shafts per hr.

Steering spindles are hardened and drawn in a double-deck furnace with the hardening chamber above and the draw chamber below. This furnace has a hearth 22 ft. long, 5¼ ft. wide and 3½ ft. high and a total connected load of 855 kw. A sketch of it is shown in Fig. 15. The work is loaded by hand on to the belt at *A*. The extension of the front of the furnace below the element level makes certain that anything clearing the front will clear the heating elements shown at *E*, which are above and below the hearth in both chambers.

The conveyor consists of three rows of chain with flat cross members that form a smooth, continuous hearth upon which work as small as washers can be placed. This chain is pulled at intervals by a lever shown at

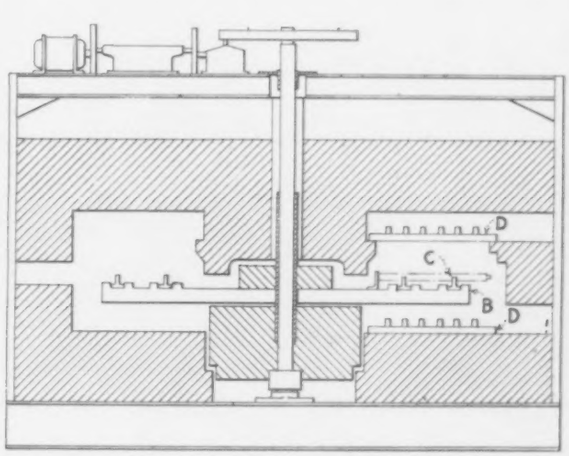


Fig. 16.—Sketch of a rotary hearth furnace for hardening camshafts.

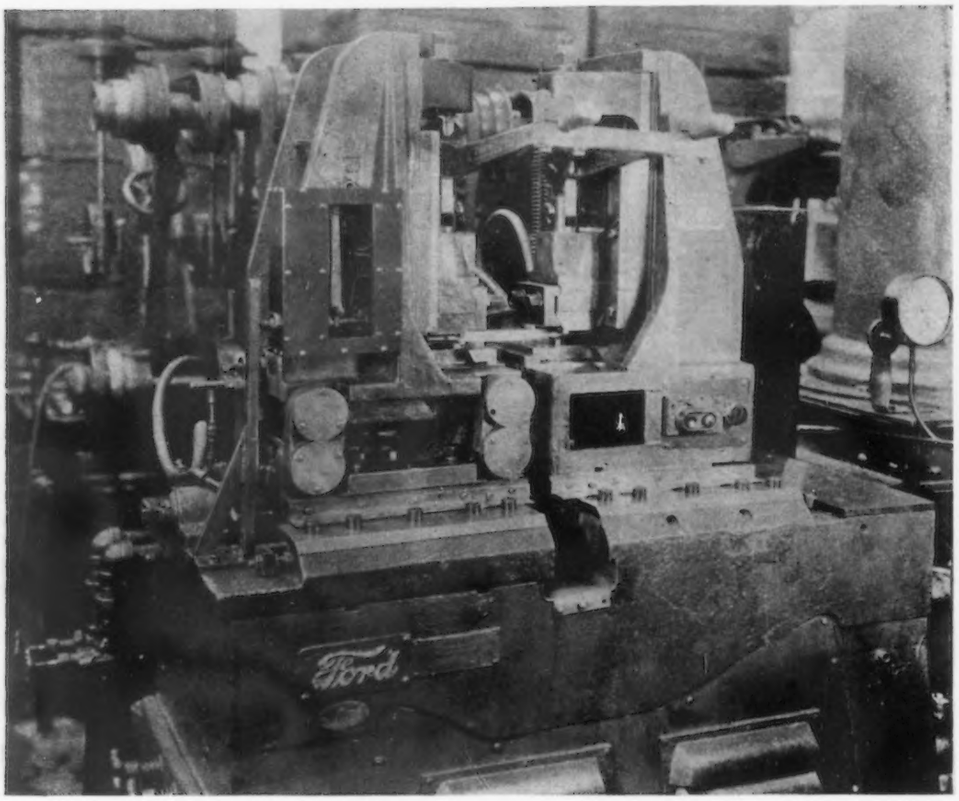


FIG. 18.—A machine developed by Ford engineers to harden water-pump shafts.

B near the discharge end, which engages pauls on the side of the chain carrier. As the work drops from the belt of the upper chamber it falls down the chute into the quench tank. As it enters the tank it strikes the baffle *C*, which helps keep the parts from piling up and directs them on to the conveyor *D*. This conveyor takes the work out of the quench tank, carrying it up over a pulley, where it is dropped on the belt in the lower or draw chamber. This belt is operated similarly to the upper one except that it is pulled from underneath. After passing through the draw chamber, the work is dumped into wagons for transmission to the next operation.

One man operates this furnace. The quenching temperature is approximately 1500 deg. F. The heating cycle is about 1 hr., while the heating cycle for drawing is about 1 2/3 hr. Being double-decked, this furnace occupies half the space formerly taken up by two furnaces on this operation.

Camshafts are hardened in a rotary hearth furnace, shown in Fig. 16. The hearth, *B*, is rotated by a central shaft, motor driven from above with a thrust bearing at the bottom and a roller bearing near the top. Supporting racks for the camshafts are carried on the hearth, *C*, where a camshaft is shown in position. The shafts are loaded and unloaded through the same door, the operator removing a heated piece and replacing it with a cold one. The heating elements are above and below the hearth, as shown at *D*. The furnace has three zones of control, with a connected load of 178 kw., and will handle 320 camshafts an hour.

The shafts are quenched in a vertical spinning machine at the right of the furnace. As they are rotated and sprayed by the solution, the end where the timing gear works is shielded from the quenching solution. Thus, while the body of the shaft has a hardness of about 55 Rockwell on the C scale, this portion of the shaft can be easily threaded. The pinion in the center of the shaft is cut before hardening. A wire brushing of the pinion is the only cleaning done on the shafts.

Crankshafts are hardened and drawn in the double-deck furnace shown in Fig. 17. The discharge end of the lower deck or hardening furnace and the charging and discharging end of the draw chamber are discernible in the picture. Crankshafts are placed on alloy shoes which slide in grooved alloy rails (seen in the opening of the lower deck). This chamber is 30 ft. long and 3 ft. 1 in. wide. When a crankshaft reaches the discharge end of the furnace, the operator raises the door by depressing the foot lever and removes it with tongs. The alloy shoes then drop into baskets.

As a crankshaft is removed from the furnace, it is placed in a spinning machine, shown at the right of the picture, which rotates it in fairly tight bearing jaws as it is immersed in a caustic quenching solution. This combination of rotation and clamping prevents distortion in quenching. As the shafts are taken from the quenching solution they are placed in grooves on the upper side of a chain conveyor. These grooves may be seen in the picture. This chain carries the shafts through the upper part of the draw chamber; as they reach the opposite end of the furnace, they strike a guide rail

which fits over the top of the grooves. The chain continues over the pulley, the shafts dropping on to rails in the lower part of the drawing chamber and being pushed by the grooves, which are now on top, back to the entering end of the furnace. When they reach the end of the furnace they are discharged on to a curved chute and removed by hand.

The draw chamber of the furnace is 34 ft. 7 in. long and 3 ft. 1 in. wide, and with the double passage of the work has a travel of over 69 ft. The quenching chamber is divided into three zones. The two chambers have a connected load of 800 kw. and handle 150 crankshafts weighing 32 lb. each, with a production of 12 lb. per kwhr. for the quenching furnace and 18 lb. per kwhr. for the drawing chamber.

Fig. 18 shows a machine developed by Ford engineers to harden water-pump shafts. It is a modified welder with the welder grips replaced by upper and lower copper grips containing round grooves which make close contact on the shafts about 1 in. from each end. One pair of grips is stationary, while the other pair is free to move horizontally away from the stationary grips. The pump shaft is placed in the lower grooves and contact made by pressure applied through a foot pedal to bring the upper grooves down upon it. As the circuit is completed, current flows through the shaft, the resistance of the steel to the passage of the current causing the pump shaft to be heated.

As the shaft becomes hot, it expands and by careful calibration it has been possible to set a release so that, as the steel reaches a correct hardening temperature, the expansion will cut off the current and at the same time flash a light to indicate that the piece is ready to quench. Since the current takes the path of least resistance, it passes through the copper grips where they make contact with the steel, thus leaving the ends cool and likewise soft for further machining. This operation is completed in 11 sec. The heating is so rapid that, even on a shaft with a finished surface, only a slight discoloration occurs. One of the shafts ready to quench is shown as the white bar in the center of the picture.

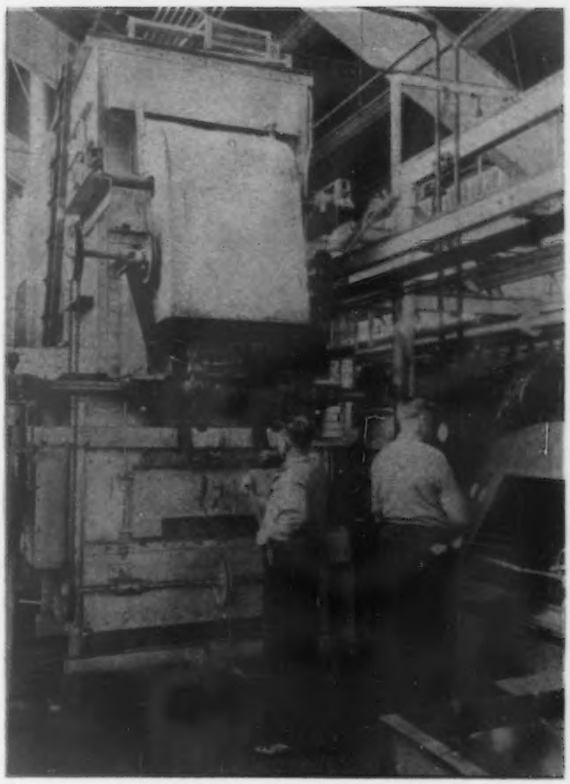
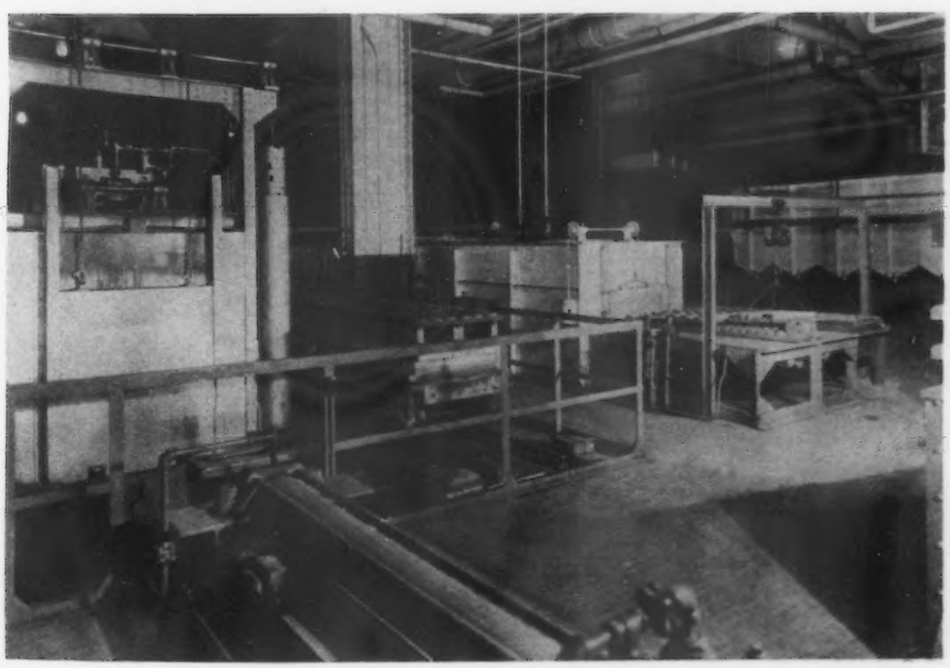


Fig. 17.—The hardening of crankshafts is done in this double-deck furnace, whose chamber is 30 ft. long. In a spinning machine at the right the camshaft is immersed in a caustic quenching solution.



FIGS. 19, 20 and 21.—This uniquely designed furnace is 250 ft. long, has three zones and holds 35 cars. It is used for heat-treating grinding wheels and other parts. A car is discharged every 20 min. There are 47 electrical limit switches to operate and control the mechanism.

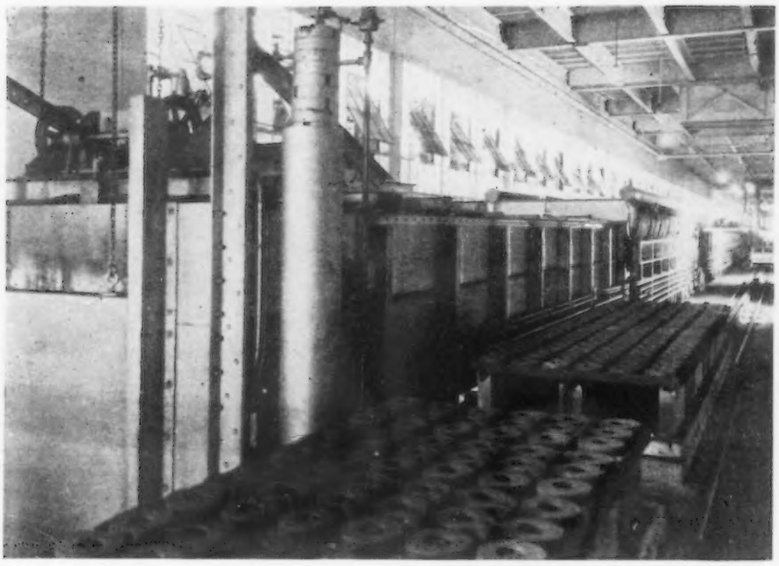


Fig. 20.—Loaded cars await their turn into the furnace.

The Ford Motor Co. makes a large part of the grinding wheels used in its plants. The various abrasive materials are bought in granular form and mixed to give the abrasive mixtures desired. The proper bonding material is then added and mixed with the abrasive in a ball mill. This gives a material resembling moistened sand, which is formed by pressing into molds of the various sizes and shapes of wheels desired. These wheels are dried in an electric furnace and loaded on to cars for a trip through a vitrifying furnace.

This furnace, views of which are shown in Figs. 19, 20 and 21, is unique in its design and operation. Its chamber is 250 ft. long, 4 ft. wide and 3 ft. high, and is divided into three zones, namely, the preheating zone which has no heat applied and which is about 50 ft. long; the heating or vitrifying zone which is 50 ft. long, and the cooling zone 150 ft. long and without heat. The heating zone has 62 overhead rod resistors 1¼ in. in diameter and 42 in. long, and a connected load of 620 kw. It operates at about 2000 deg. F. and is divided into four temperature central zones. Since the side walls of the furnace do not extend to the floor, there is an open space of about 12 in. beneath the cars which facilitates locating any conveyor trouble that might occur.

With the exception of loading and unloading grinding wheels from the cars, the operation of the furnace is automatic. The cars, which are 6 ft. long and 3 ft. wide, are loaded on a track paralleling one side of the furnace. They have a cast iron frame with an angle iron on the sides which engages the sand seal on the furnace side wall. The top of the car is made of refractory material and extends about 6 in. above the frame work. On each end of the car and underneath it is a tapered lug for engaging the chain links of the conveyor mechanism. These lugs are tapered in the opposite direction so only the one on the end of the car, which is the front when the car is in motion, will engage the chain. A car loaded with grinding wheels is pulled down the outside track until it is about even with the end of the furnace, where it is left by the chain which returns underneath the floor to be pushed on to the transfer car by the next car brought down.

The transfer car, shown in Fig. 19 with the front wheels of the furnace car just rolling on to it, moves on rails in a pit which is at right angles to the length of the furnace. As a car loaded with grinding wheels is pushed on to the transfer car, it makes contact with a switch which starts the transfer car in motion. When the transfer car comes in line with the rails in the furnace, it makes further contact with switches that open both end doors of the furnace and through a delayed switch operates a hydraulic ram to push the filled car into the furnace and discharge a vitrified car from the opposite end. This hydraulic ram can be plainly seen in the lower foreground of Fig. 19.

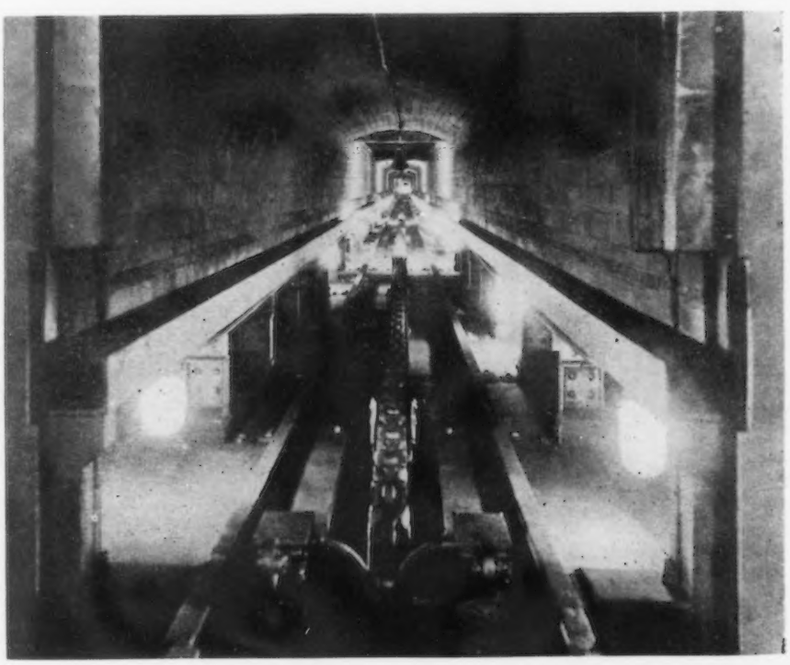


Fig. 21.—The furnace holds 35 carloads at one time.

With the car in place in the furnace, the ram is withdrawn and the doors closed. When the ram is withdrawn, another switch is operated to return the now empty transfer car at the loading end of the furnace to its original position. At the discharge end of the furnace is another transfer car operating through the same cycle and at the same time as the car just described, except that the loading cycle is reversed. It is empty when it comes to the furnace door and loaded when it leaves. All of these switches are interconnected so, if one fails to work, they are all automatically shut off. To operate and control the mechanism of this furnace requires 47 electrical limit switches.

The furnace holds 35 cars at one time with a car discharged every 20 min., making a furnace cycle per car of about 12 hr. The cars are discharged at approximately room temperature.

The duplexing process in the iron foundry is unusual and could probably be used by no other company, because no other foundry operates under conditions similar to those at the Ford plant. In this process the iron from the blast furnaces is mixed with cupola iron, and this mixture finished in a direct arc electric furnace. This mixing takes place in a large cylindrical steel drum lined with refractory brick and well insulated. The mixer is heated by oil. The blast furnace iron is transferred into the ladles by locomotives and emptied into the mixer by an overhead crane. Here the blast furnace metal is mixed with scrap metal. From the mixer the metal in ladles is hauled by electric trucks to the arc furnaces.

The iron that goes into the electric furnace is weighed at three stages: The scrap before charging in the cupola, each ladle of molten iron either from the cupola or blast furnace, and each ladle taken from the mixer. Since the analyses of the scrap and blast furnace iron are known, this assures good control of the iron entering the electric furnaces. The time for heating is about 20 min. for 15 tons. Occasionally some slight adjustment of iron is made in the electric furnaces. The iron is tapped from the furnaces into monorail ladles for transportation to various parts of the foundry. This installation has recently been increased by another mixer and two electric furnaces.

In the brass foundry are several 2000-lb. rocking, indirect arc furnaces used mostly for melting brass and bronze. Each furnace is covered by a hood with an exhaust to carry out any escaping fumes, especially while the door is open during charging. These furnaces are arranged for rapid and convenient charging. On the floor above and directly over each furnace is a sheet iron stack with a hinged door in the side. The charges, properly weighed and proportioned, are placed in barrels near this door. When the furnace has been emptied of metal and rotated so that the open door is on the top, a man on the furnace floor pushes a button which lights a red light on the furnace floor and a green light on the charging floor. Inside the steel stack is an inverted steel cone with the end removed. When the door in the stack is opened, a barrel containing material for charging is pushed up on a two-wheeled buggy and dumped into this inverted cone. This cone serves the double purpose of holding the inverted barrel upright and directing the charging material into the furnace door. When the charging is completed, a man on the charging floor pushes the button turning out the red light on the furnace floor and replacing the green light on the charging floor with a red light. A charge is handled in this manner in 7 min.

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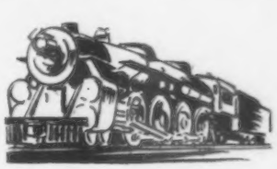
Derailment Caused by Axle Broken at Built-up Fillet

LAST April several cars on a freight train on the Pennsylvania Railroad were derailed, with disastrous results. Investigation showed the responsibility to lie in a broken axle under one of the cars. The train carried 123 cars, of which 108 were loaded. The car causing the trouble was carrying more than 50 net tons of bituminous coal.

Examination showed that this axle had had a worn area built up by electric welding at the point of the journal fillet. Such practice was said never to have been used by the Pennsylvania Railroad, the axle having been built up and installed under the car while it was operating on another road, which later discontinued that practice.



Building up fillets of worn axles by the welding process has been prohibited since 1924 by the American Railway Association. A circular of that organization refers to this action as bad practice and calls upon all the railroads to take out of service all axles to which this treatment has been applied. The circular states that the transformation in the structure, with corresponding internal stresses at points in an axle where bending stresses of any magnitude occur, will readily permit the development of detail fractures. In the case in question this detail fracture had progressed over 90 per cent of the cross-section area before the final break occurred.

Tests of the metal of the journal showed it to be of a good quality of material, with elongation limit (average of two samples) at 37,400 lb. to the sq. in.; ultimate strength, 72,150 lb.; elongation in 2 in., 25.5 per cent; and reduction of area, 41.6 per cent. The carbon worked out at 0.43 per cent, manganese 0.37 per cent, phosphorus and silicon under 0.010 per cent and sulphur 0.036 per cent. While slightly low in manganese, this analysis verifies the good qualities found on physical test.

Fig. 41.—To prove that standardized details of construction do not necessarily involve a deadly sameness

WALLS, FLOORS AND PARTITIONS

By THOMAS J. FOSTER
Chairman, National Bridge Works,
Long Island City, N. Y.

A SURVEY of the use of steel in residences in the United States shows that in nearly all of them steel is substituted for wood without any offset for the use of the more expensive material, or a reduction of the 53 per cent waste mentioned by the Department of Commerce. Nor has there been an attempt to profit by the criticisms and suggestions of H. G. Wells, Dr. Keppel, and others who have called attention to our antiquated methods of building.

Those who built steel in residences in 1930 contented themselves with variations of the method used by Naugle in 1907. A large organization with plenty of money and experience to carry on experimental work was unable to use this method successfully. It would seem, therefore, that we must make some other approach to the problem of steel in houses.

New materials require new methods. With the use of steel for the frame of a house a change becomes evident in the relationships of the structural parts, and the functions of walls, partitions and floors must be studied in the light of new conditions. Many successful attempts will be made to bring together these functions and the materials that suit them. It would be unwise to find fault with previous attempts to solve these problems unless a possible solution were

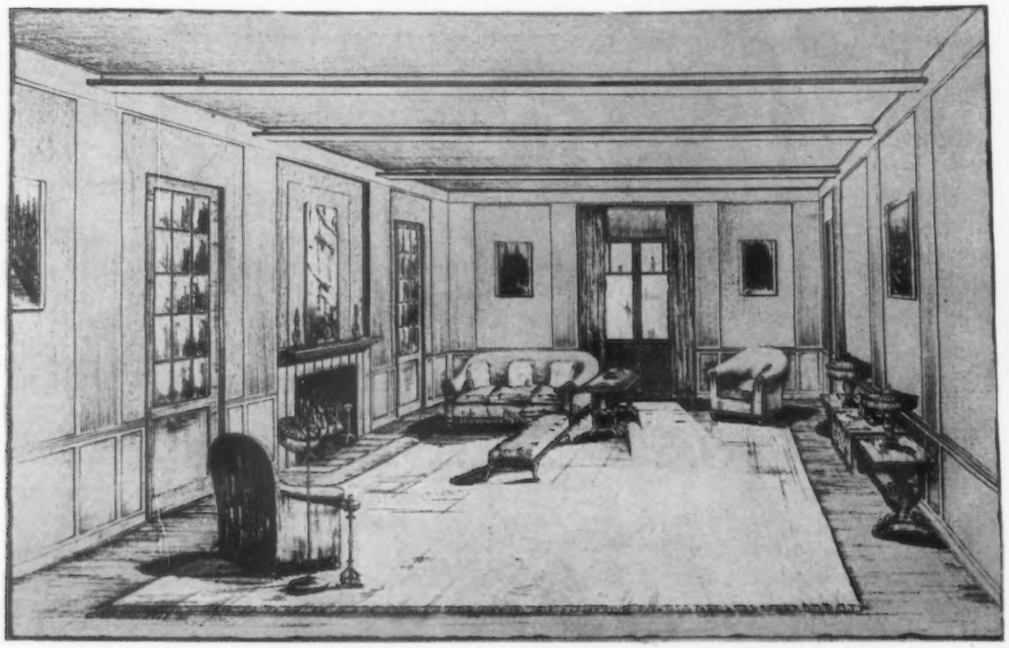


FIG. 40.—Interior of the slab-sheathed house. The floor (between exposed beams) is only 3 in. thick, including the finish surface.

of appearance in the finished product, here are twelve houses all having the same floor plans and framing.

HAVE SEPARATE FUNCTIONS

WALLS, floors and partitions are three types of elements in house construction lending themselves peculiarly to the use of steel members. Analysis of their several functions helps to determine in what way they may be best framed and built. If the wall be made merely a garment, clothing the house, its construction will be at once greatly lightened. Partitions become merely curtains between rooms, if the steel frame be made to carry all the load. And floors made in slabs, with the beams exposed or covered, can be both fireproof and inexpensive. This is the concluding installment of six in this article telling what has been done, and what may be done, in the use of steel for private dwellings.

offered. The following is an attempt to show the relationships of the materials to one another and to the functions which they fulfill.

The Wall

HERETOFORE the function of a house wall has been to support the floor loads, furnish rigidity, offer protection from the elements, and provide architectural treatment for the exterior and interior. Such a wall was necessarily heavy and built by a slow hand process. But if the functions of strength and rigidity are transferred to a steel frame of the type used in office buildings, so that the columns are at the corners of the rooms, with girders between columns and a filling in of floor beams, the frame becomes simple, is made up of the cheapest shapes obtainable, has the fewest pieces to handle and takes but little space.

This allows the wall to become merely a clothing on the outside of the framework, and, having fewer functions to perform than the old-fashioned bearing wall, it offers great flexibility of treatment and a wide choice of materials. Weight ceases to be essential. Small, heavy pieces laboriously piled one on top of another are not necessary for beauty. Fig. 38 shows a window slab making one unit from floor to ceiling of the window frame, sash and spandrel under the window. Insulation and a heating unit can be placed back of this spandrel and fastened to it.

The Partition

GOOD-QUALITY wood has been abundant in this country, and wood studs, wood lath and plaster made a cheap partition. But the expansion and contraction of the wood caused the plaster gradually to loosen and drop off, it made good housing for vermin and supplied fuel for any fire that might develop, and was noisy.

With a steel frame to carry all the loads of floors and partitions, the partitions are merely curtains between rooms. Sufficient strength to carry their weight from floor to ceiling can be obtained without the thickness required of the load-bearing partition. Good insulating materials are available.

Partitions do not have to be large, bare surfaces requiring special treatment to break their monotony. The side of a room may be made in easily-handled units that in themselves break the monotony, and require no artificial treatment to make them attractive. Shop-made units may extend from floor to ceiling and require no labor after installation except decoration.

The Floor

IT is difficult to solve the floor problem until we cease to imitate the traditional wood joists with a wood flooring fastened to the top and a ceiling plastered to the bottom. This was the only floor possible in its day, but the entire construction had all the bad qualities of wood construction. The flat ceiling was difficult and expensive to decorate.

With the use of steel it is not necessary to have the joists close together. Slabs 4 ft. wide need not be over 3 in. thick if cementitious materials are used. Such slabs are economical to make, easily installed, can be insulated for sound. The bottom of the slab when installed is ready for paint or other finished decoration.

Fig. 39 shows an exterior of a proposed construc-

tion more clearly than is possible by verbal descriptions. The shop-made slabs are clearly defined, waterproof, economical to make, easily handled and are quickly fastened at the top and at the bottom to the steel frame. Many materials, colors and textures can be used for the face of this slab, which allows a greater flexibility of treatment than has ever been known in building construction. It gives the artist a free hand to do excellent work, unhampered by tradition, and without resorting to the bizarre. Steel enamel sheets

titions. It is good architecture to show the slab construction if the artist does his work satisfactorily. A blank wall is characterless, so paper, wood paneling and other expedients have been used to present a pleasing surface.

We can add character to the interior decoration by building it into the wall instead of applying it to the surface.

Fig. 40 shows also a ceiling of character in con-

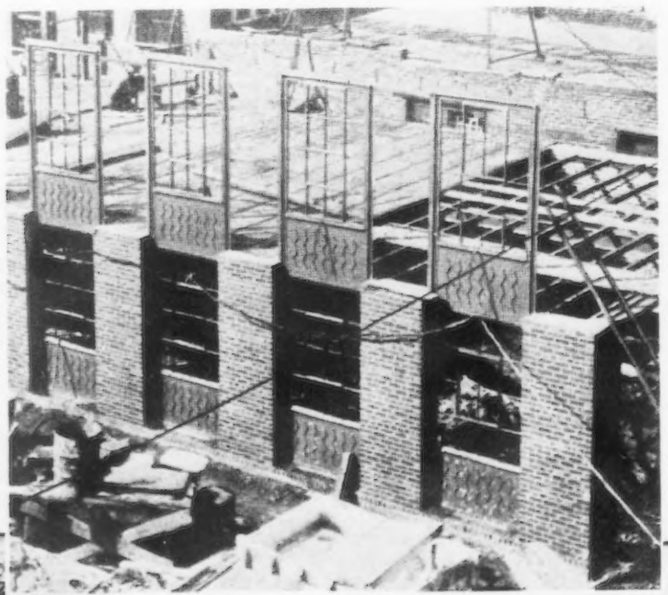
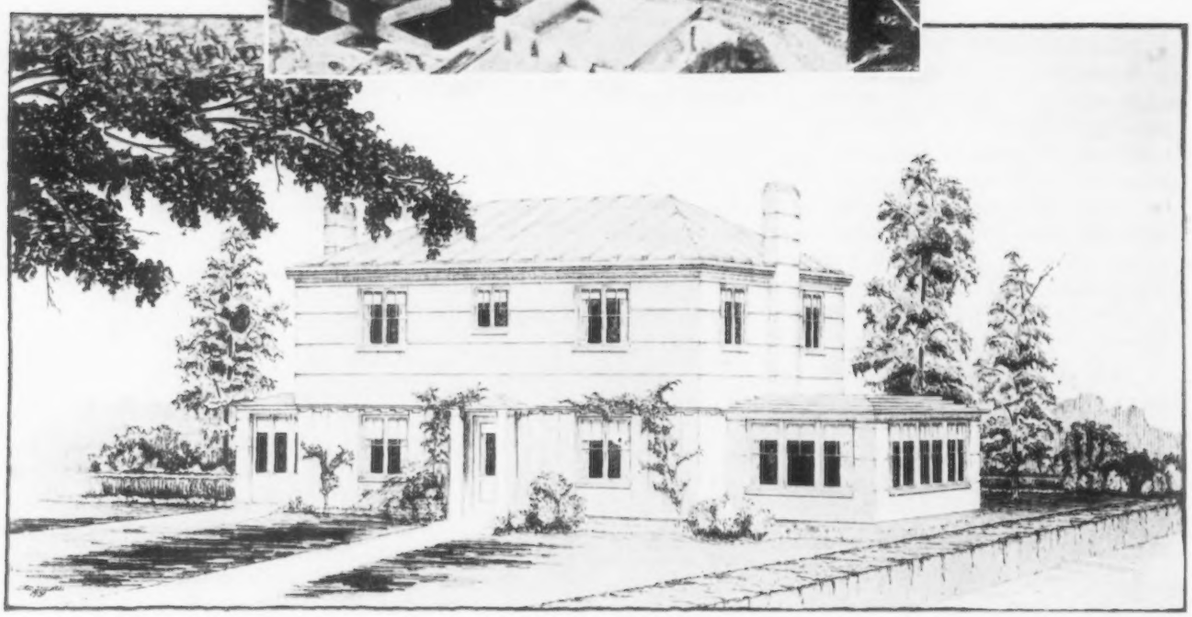


FIG. 38.—Window slab of one unit from floor to ceiling includes window frame, sash and the spandrel below. Erection is much simplified by this unit construction.

FIG. 39.—House finished with shop-made waterproof slabs, fastened top and bottom to the steel skeleton of the structure. Flexibility is here served in texture and color as well as in arrangement.



of various colors are available. The finished surface of the slab is made in the shop.

The amount of insulation needed will determine whether the wall has a thickness of one slab, or of two slabs with an air space between. A double-slab wall should cost no more than the brick veneer portion of the typical wall now in use.

The interior of such a slab-formed room is shown in Fig. 40. Three inches of thickness will give enough strength and sound insulation for non-bearing par-

nection with the wall. The distance from the ceiling between the beams to the finished floor above need be only 3 in., and retain the necessary strength, stability and soundproofness, at no greater cost than the ordinary wood floor with its 12-in. depth, its combustibility and housing for vermin.

Thin, strong slabs for walls, partitions and floors are made possible by the use of steel reinforcement and the strength of the steel connections to the steel frame. Such buildings could go through the con-

vulsions of an earthquake without loosening the slabs from the frame. Steel is used for strength, and insulating materials are used for insulation, and by the correct combination of materials according to their functions we hope to reach the goal in good house building.

But the ability to produce an economical steel frame and slab construction will not solve the housing question. How to create an attractive house and then merchandise it are problems of equal importance.

There are only a few practical arrangements of rooms in a seven-room house. Give one floor plan to a hundred architects and they will produce a hundred different expressions of the exterior and interior. Individuality is attained by the use of texture and color in the visible portions of the house, and by the furnishings within and landscaping without. The structural part of the house may therefore be a standard product, without the sacrifice of individuality. Fig. 41 is an illustration of the exteriors of twelve houses built from one plan.

We have good materials that are cheap and that offer a wide range of expression. But we have not been assembling them in an economical or satisfactory manner. It is possible that only one thing is lacking to solve the housing problem—the use of these materials in a correct relationship. A corporation unprejudiced by building traditions should be able to employ these materials economically and efficiently.

Art Must Not Be Forgotten

Each type of civilization has evolved an architectural expression to suit the materials at hand, the requirements of comfort and the spirit of the time. It is stupid to insist on adapting new materials to old forms. The use of modern products in convenient shapes designed for proportion, color and suitability will result in the sanest architectural composition.

But the architect must be more than a craftsman —he must be an artist. His work is only half done when the highest expression has been given to the material structure of the house. He must also express the dignity and beauty that are the spiritual structure of the home. Many architects have experimented widely with new architectural forms, with unsatisfactory results. They have expressed the body of the house, but have neglected the soul of the home.

This article has attempted to review the trials and failures of the building industry and to give some hope in its efforts to solve the problem of the small house. The building industry as a whole must face the matter squarely. It must not fail to do its share in a country where so much has been accomplished for the betterment of humanity. Here is a challenge that cannot be ignored.

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Developments in High-Frequency Furnaces for Steel

PROGRESS made in the development and application of high-frequency induction furnaces of 600-lb. capacity, resulting from experience in the production of several thousand heats of steel, has been reviewed by N. Broglio (*Stahl und Eisen*, May 14 and 21, 1931). Electrical improvements included reduction of the stray field loss by bringing the furnace leads closer together, and improvement of the power factor by reducing the frequency below 500 cycles per second.

The change in frequency apparently increased the life of the condensers. Air-cooled condensers were displaced by water-cooled, and instead of tin-foil suspended between oiled paper, rolls of aluminum arranged horizontally and cooled by copper coils were used. Economy demands an abundance of capacity in the battery of condensers, for as the walls of the crucible become thinner the improved coupling requires more capacity to correct the power factor, so that, if the condensers are too small, a point will be reached where the power supplied to the charge becomes insufficient and crucibles still in good shape from a ceramic standpoint must be discarded.

A considerable saving in time and expense was accomplished by the substitution of lutting sand for quartzite as an acid lining. A 3 to 4-in. wall of moist sand was tamped between the furnace coil and a pattern. After removing the pattern, the crucible was carefully charged and heated to redness in about 1½ hr. to dry the crucible. After two melts the sand is generally so well sintered that there is little danger of failure. The time for the first heat was reduced about an hour with saving in power. No metallurgical trouble occurred and the damp lining caused no electrical irregularity.

One of the chief advantages of induction heating is that the heat is developed within the charge itself in contrast to most other types of heating where the source must be somewhat higher in temperature than the charge in order that heat may pass through the container or the slag layer to the metal. The demands upon the refractories used are therefore less severe than in the case of steel production by the crucible process.

The churning action of the high-frequency field homogenizes the charge and promotes reaction. No difficulty with slag inclusions results if the steel is deoxidized in the proper manner and is properly poured. If the charge is allowed to stand a short time, the gases and inclusions have time to escape; the drop in temperature with the power off for a 600-lb. charge at 2950 deg. F. in 15 min. is about 150 deg.

The power required for a test heat was 537, 150, and 687 kwhr. per ton respectively for melting, refining, and total.

In a hot crucible containing a residue of 55 to 90 lb. of metal from the previous heat, a charge of 575 lb. of steel can be melted in about ¾ hr. in a 150-kva. furnace, while in a cold furnace the time may be 1 to 1¼ hr. The rapidity with which melts can be made in high-frequency induction furnaces suggests replacement of older steel-making processes by large units of this type, although exact predictions would be premature.

BRONZE CASTINGS NOW MADE

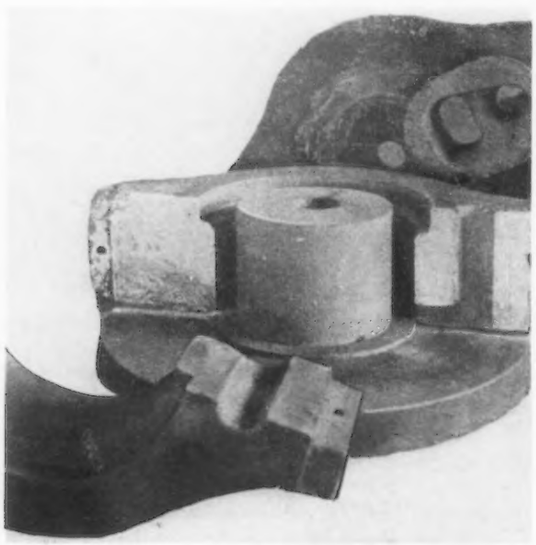
By HENRI MARIUS

Lenoir Car Works, Lenoir City, Tenn.

THE word "permanent" may not be a perfect technical designation of iron molds now commonly used in casting bronzes, brasses, gray irons and aluminum alloys, but considering their remarkable performance compared with sand molds—having frequently a life of close to 4000 castings and in the case of aluminum alloys exceeding this figure by several thousands—we cannot be far wrong in calling such molds permanent.

Their chilling effect is the chief metallurgical claim of permanent molds. This produces castings of a fine homogeneous microstructure, free from metallic segregations or burned-in sand, and hence castings of greater all-around strength and easier machineability. Results of physical tests contained in Tables I and II are representative of actual foundry practice over a period of four years. They have been gathered together in order to express in figures (at least insofar as strength is concerned) the betterment in quality of bronze through permanent molding as compared with sand molding.

All test bars were cut from actual castings and each permanent-mold casting, with the corresponding sand-mold casting from which test bars were cut, were of identical pattern, poured from the same heat from the same ladle. Test bars were cut from the same position in each casting in order to have an accurate physical test of the castings rather than the test bars, which are not always true representatives of the physical properties of the castings themselves.



Permanent mold for locomotive floating bushing, showing gating arrangement and base plate on which mold proper rests.

Large Quantity of Scrap Used

Test heats were picked at random. In each case the furnace charge was composed of 98 per cent scrap and 2 per cent new metal. The value of the hardness figures in Table II must be read in conjunction with data of Table I to be appreciated, for part of the small increase in hardness is the natural result of finer, denser microstructure and a corollary expression of greater all-around strength as evidenced by higher elastic limits, ultimate tensile strengths and elongation, as shown in Table I.

In the field of simple leaded bronzes, now in unreasonably high vogue among wearing alloy manufac turers and users, permanent molds, in addition to improvements caused by the chilling effect on fracture, increase the power of the copper-tin alloys to hold in more lead. This is due to the tin combining with a greater portion of copper, thus promoting the formation of a larger amount of a finer network of copper-tin alloy, which by solidifying first retains the lead evenly distributed throughout the mass in the form of fine globules until the lead in turn solidifies. In this manner 5 per cent tin can hold in as much as 40 per cent lead in a copper-base alloy without segregation.

Railroads Use Leaded Bronzes for Iron Molds

Unfortunately bronzes with such low percentages of tin and such high percentages of lead can have only limited industrial application, because of their lack of sufficient hardness, resilience, tensile strength and compressed strength. In recent years highly leaded bronzes cast in iron molds have found favor with railroads, which use them extensively as wearing alloys for locomotive bearings. It is our opinion that highly leaded bronzes, will find more useful application in the manufacture of car-journal bearings, for it is possible to produce from them a harder, stronger and more rigid bearing than at present, capable of taking a highly polished surface of such anti-frictional quality as to eliminate the necessity of the present lining alloy or babbitting.

IN PERMANENT MOLDS

IN a space 30 x 100 ft. and with a total working force of six unskilled mechanics, the Lenoir Car Works, using permanent molding practice, sets up, pours and shakes out (including transportation of castings to the cleaning room) 130 to 150 molds, representing 30 to 50 different pattern bronze castings with a total weight of over 20,000 lb., in an 8-hr. shift. The life of some molds is close to 4000 castings.

This article deals with the company's experience in using permanent molds and discusses pouring temperatures, melting conditions, gating, risers, wall thickness of molds, clamping molds and type of iron in molds. It is based on a paper presented by the author before the American Foundrymen's Association.

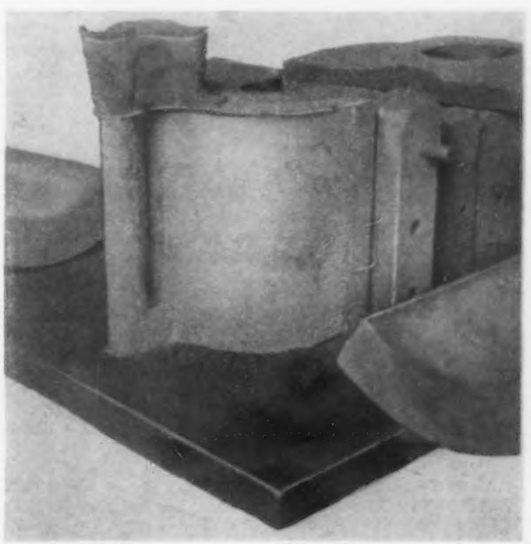
In red brass, permanent molds correct porosity and the formation of dendrites commonly found in sand-cast red brass of unbalanced composition in which the white metals such as tin, lead or zinc are abnormally low or high. As for the newer but rapidly expanding alloys of aluminum, they are among the easiest to cast in permanent molds. In fact, any kind or composition of non-ferrous alloys can be cast in iron molds, provided the design of castings is compatible with this new molding process.

In bronzes the average foundryman may feel that the chilling effect of iron molds is liable to produce hard and brittle castings, as in gray iron and steel. Such is not the case. Hardness in simple bronze is primarily a function of tin, which forms with copper several alloys, some hard, some soft. When we consider the chemical valences of these two metals, we find that the two extremes of these binary copper-tin alloys correspond to formulas Cu_4Sn and Cu_2Sn_2 respectively. The latter is called the "eutectic" because of its lower melting point and it is softer than the one richer in copper, Cu_4Sn. In fact, the eutectic is little harder than pure copper, so that in the end a simple bronze is hard in proportion to the amount of Cu_4Sn it contains.

The chilling effect of the iron mold causes nearly all, if not all, of the tin to remain in the bronze in the form of Cu_4Sn, whereas in the sand-cast alloy the slow solidification has almost the opposite effect. Therefore, the same bronze composition, when cast in iron molds, will be harder than the sand cast only in proportion to the excess of Cu_4Sn plus the smaller portion of hardness derived from the greater density of mass of the chill cast alloy.

Correct Pouring Temperature Important

With iron molds the ranges of pouring temperatures are 75 to 100 deg. F. higher than when sand molds are used. For example, the pouring tempera-



Duplex permanent mold for phosphor-bronze bushings, showing cores in position.

ture range of sand-cast locomotive bearings of 80-10-10 composition is 1700 to 1800 deg. When iron molds are employed, the corresponding range is 1775 to 1850 deg. Since the molten alloy loses heat and fluidity incomparably faster in an iron mold, it must possess these two physical conditions in order for the metal to reach all parts of the mold before it becomes cold and sluggish and to give a sound casting of sharp, well defined contours free from red spots, cold shuts, wrinkles and draws under the riser and gate—defects characteristic of cold metal. Likewise, the rapid solidification of the iron-mold cast alloy is a hindrance to the release of entrapped air or gases formed in the mold or absorbed by the charge during melting, this difficulty being especially pronounced in iron molds of castings having thin sections.

On the other hand, should the alloy be poured too hot, the erosion on the mold face and the heating of the face will be unnecessarily great and will hasten the failure of the mold. Castings will come out with honeycomb patches here and there, caused by volatilization or oxidation of carbon particles peeled from the surface of the mold at those areas where erosion and overheating have been greatest.

Porosity and Oxidation to Be Avoided

Defects of porosity and oxidation resulting from faulty melting will be made less apparent and less harmful in the castings by reason of a finer and more homogeneous microstructure. Before it is poured, the melt should be stirred with an iron rod shaped like a paddle, thus imparting to the liquid alloy in the ladle a somewhat centrifugal motion which facilities the releasing of absorbed or neutral gases. The light and stable oxides of zinc and tin and impurities such as alumina and sulphides will come to the surface to be skimmed away with the rest of the slag.

Since the molecular weights of copper and lead oxides are almost as great as those of brass or bronze, they are easily diffused and held throughout the mass of the metal, becoming more difficult to extract by stirring only. In such cases a small amount of phosphor-copper or magnesium will help effectively the purpose of stirring by reducing a good part of these oxides.

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TABLE I—COMPARISON OF PHYSICAL TEST DATA OF SAND-MOLD AND PERMANENT-MOLD CASTINGS GROUPED ACCORDING TO CHEMICAL ANALYSES

GROUP 1.*—Chemical Composition of Heats Grouped Together

Heat Nos.	Thickness† Of Castings Test Bars Were Cut From in In.	Weight† in Lb.	No. Pcs.**	Sand Cast: Elast. Limit, Lb. per Sq. In.	Sand Cast: Tensile Strength Lb. per Sq. In.	Sand Cast: Per Cent Elong. in 2 in.	Permanent-Mold Cast: Elast. Limit. Lb. per Sq. In.	Permanent-Mold Cast: Tensile Strength Lb. per Sq. In.	Permanent-Mold Cast: Per Cent Elong. in 2 In.
40-26	1½	175	2	17,440	28,210	16	20,050	32,000	17.5
53-26	1½	120	3	17,930	30,300	17	20,000	35,000	20.0
68-27	2	200	3	16,410	28,100	16	20,500	33,650	19.0
102-27	2½	150	4	15,900	27,480	14.5	20,750	33,350	15.5
103-28	1	50	4	17,620	29,600	19	20,500	33,800	19.0
120-28	1	40	2	18,750	29,450	18	20,000	34,750	20.5
130-28	3	240	4	14,150	19,000	11	18,700	29,420	14.0
9-29	1¾	75	2	13,070	16,130	5	20,100	26,730	7.5

Average permanent set in fraction of an inch under 65,000 lb. load on one-inch cubes: Sand-cast 0.184; Permanent-mold cast 0.162

*Cu 77.50 to 80 per cent; Sn 7 to 8 per cent; Pb 11.50 to 13.50 per cent; Zn 0.50 to 1 per cent; Sb 0.10 to 0.35 per cent; undetermined 0.10 to 0.30 per cent.

GROUP 2.††—Chemical Composition of Heats Grouped Together

32-26	2	200	4	15,000	23,040	9	18,500	25,150	11
70-26	1½	120	4	15,350	24,000	12	18,000	27,150	14
76-27	1½	175	3	16,670	23,250	7	17,600	26,750	8.4
4-28	3	240	4	14,400	18,600	6	18,700	27,800	13
6-28	2½	150	2	12,000	22,450	12	14,200	23,700	12
14-28	1	40	2	15,900	26,650	14	17,350	28,000	13.5
26-29	1¼	75	2	14,170	18,850	8	19,250	27,740	10.5

Average permanent set in fraction of an inch under 65,000 lb. load on one-inch cubes: Sand-cast 0.240; Permanent-mold cast 0.204

††Cu 70 to 72 per cent; Pb 20 to 22.5 per cent; Sn 5 to 6 per cent; Zn 0.70 to 1.30 per cent; Sb 0.35 to 0.60 per cent; undetermined 0.15 to 0.35 per cent.

GROUP 3.*†—Chemical Composition of Heats Grouped Together

M20-26	1½	30	3	17,200	36,000	29	18,700	38,300	28
M48-26	1	15	2	20,050	34,900	24	21,300	37,000	20
M72-27	1	10	2	20,100	35,000	24	21,100	38,700	21
M77-27	2	120	4	18,300	35,500	32	20,000	40,150	32
M90-28	2½	100	4	17,940	29,760	23	19,380	34,000	21
M95-28	1¾	90	3	17,700	30,200	17	18,150	34,600	18
M104-28	1½	75	4	17,650	31,500	22	18,500	35,000	22
M109-28	2	50	3	15,000	25,400	14	17,800	29,430	18
M19-29	1¼	75	2	15,080	16,930	6	21,860	31,660	10
M21-29	1½	40	2	16,000	18,600	5.5	21,500	26,300	4

*†Cu 85 to 87 per cent; Sn 6 to 7 per cent; Pb 3.5 to 5 per cent; Zn 2 to 3 per cent; undetermined 0.0 to 0.2 per cent.
NOTE: Diameter of test bars for all three groups was 0.505 inch.
†Thickness and weight of castings from which test bars were cut.
**Number of pieces tested in order to obtain average.

However, it is best to watch diligently the whole melting process to prevent the expensive and ineffective doping of the melt with fluxes of doubtful value, a method by which the average foundryman tries to retrieve a carelessly melted heat. Ideal melting conditions can be obtained only when melting is done in a neutral atmosphere in which the amount of heat transmitted to the charge to be melted remains constant per time unit throughout the melting period. As this is impossible, the essence of good melting practice then becomes strictly a matter of learning how to control and intelligently regulate this atmosphere between reasonable limits to suit the needs of the charge to be melted.

Bottom Gating Is Necessary

Use of bottom gating is almost necessary for mass production of sound castings in permanent molds, as the danger of undue erosion and overheating of small areas of the mold surface, caused by rapid and direct flow of the hot molten metal, is avoided. Bottom gating also affords a better upward draft for occluded and generated gases from volatile matter in the mold coating. Moreover, the metal coming up from the gate at the bottom rises in the mold evenly and gently and lays on the walls of the mold; there is no splashing with its subsequent formation of cold shuts and air pockets.

(To be concluded)

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TABLE II—BRINELL HARDNESS OF CASTINGS OF TABLE I

GROUP 1*Chemical Composition of Heats Grouped Together

Heat Nos.	Thickness,† in In.	Weight,† in Lb.	Depth,** in In.	Brinell No. Sand-Cast		Brinell No. Permanent-Mold Cast
40-26	1½	175	¼	62		66
			1	58		64
				60	Avg.	65
53-26	1½	120	¼	59		63
			1	55		61
				57	Avg.	62
68-27	2	200	¼	60		66
			1¼	54		65
				57	Avg.	65.5
102-27	2½	150	¼	58		61
			1¼	54		61
				56	Avg.	61
103-28	1	50	¼	61		67
			⅝	61		67
				61	Avg.	67
120-28	1	40	¼	65		69
			⅝	64		70
				64.5	Avg.	69.5
130-28	3	240	¼	62		64
			1½	50		64
				56	Avg.	64
9-29	1¾	75	¼	48		59
			1	44		59
				46	Avg.	59

*Cu 77.50 to 80 per cent; Sn 7 to 8 per cent; Pb 11.50 to 13.50 per cent; Zn 0.50 to 1 per cent; Sb 0.10 to 0.35 per cent; undetermined 0.10 to 0.30 per cent.

NOTE: See Table I for analyses of metal of the three groups.

†Thickness and weight of castings from which test bars were cut.

**Depth under skin of castings where tests were made.

GROUP 2††—Chemical Composition of Heats Grouped Together

Heat Nos.	Thickness,† in In.	Weight,† in Lb.	Depth,** in In.	Brinell No. Sand-Cast		Brinell No. Permanent-Mold Cast
32-26	2	200	¼	57		60
			1	50		57
				53.5	Avg.	58.5
70-26	1½	120	¼	58		57
			¾	53		57
				55.5	Avg.	57
76-27	1½	175	¼	58		60
			¾	54		60
				56	Avg.	60
4-28	3	240	¼	54		61
			1½	47		60
				50.5	Avg.	60.5
6-28	2½	150	¼	54		59
			1¼	52		58
				53	Avg.	58.5
14-28	1	40	¼	53		59
			¾	53		59
				53	Avg.	59
26-29	1¼	75	¼	50		60
			1	48		60
				49	Avg.	60

††Cu 70 to 72 per cent; Pb 20 to 22.5 per cent; Sn 5 to 6 per cent; Zn 0.70 to 1.30 per cent; Sb 0.35 to 0.60 per cent; undetermined 0.15 to 0.35 per cent.

NOTE: See Table I for analyses of metal of the three groups.

†Thickness and weight of castings from which test bars were cut.

**Depth under skin of castings where tests were made.

GROUP 3*†—Chemical Composition of Heats Grouped Together

Heat Nos.	Thickness,† in In.	Weight,† in Lb.	Depth,** in In.	Brinell No. Sand-Cast		Brinell No. Permanent-Mold Cast
M20-26	1½	30	¼	60		62
			⅞	55		64
				57.5	Avg.	63
M48-26	1	15	¼	61		70
			¾	65		67
				63	Avg.	68.5
M72-27	1	10	¼	61		61
			⅝	61		61
				61	Avg.	61
M77-27	2	120	¼	50		60
			1	57		60
				58	Avg.	60
M90-28	2½	100	¼	65		63
			1⅛	57		63
				61	Avg.	63
M95-28	1¾	90	¼	57		67
			1	55		66
				56	Avg.	66.5
M104-28	1½	75	¼	61		62
			1	57		62
				59	Avg.	62
M109-28	2	50	¼	55		65
			1	53		65
				54	Avg.	65
M19-29	1¼	75	¼	58		58
			⅞	51		57
				54.5	Avg.	57.5
M21-29	1½	40	¼	50		55
			1	48		55
				49	Avg.	55

*†Cu 85 to 87 per cent; Sn 6 to 7 per cent; Pb 3.5 to 5 per cent; Zn 2 to 3 per cent; undetermined 0.0 to 0.2 per cent.

NOTE: See Table I for analyses of metal of the three groups.

†Thickness and weight of castings from which test bars were cut.

**Depth under skin of castings where tests were made.

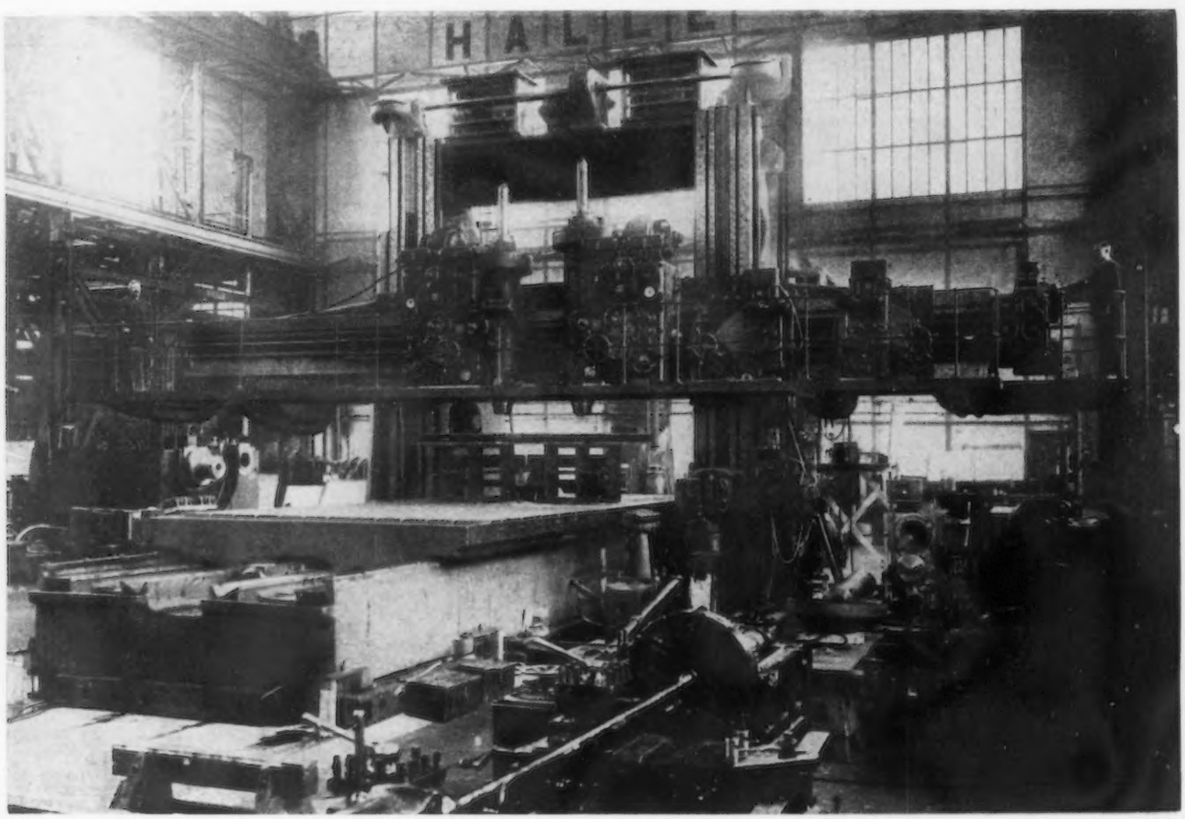
CHILLING THE WEARING

By U. KAUERMANN
Consulting Engineer in the United States for Schiess-Defries A.G., Düsseldorf, Germany

ADVANCES in the technique of producing sound, close-grained castings, especially those portions exposed to severe wear, is of prime importance to builders of heavy machine tools. This is due to the fact that the design and construction of such tools calls for the massing of metal, which in turn causes uneven cooling and the formation of blow holes and sponginess from excessive depositions of graphite.

The problem of producing large castings free from such defects has been given close attention by Messrs. Schiess-Defries, Düsseldorf, Germany, prominent machine tool builders, who are successfully chilling heavy bedplate castings over those parts especially subject to wear, such as cheeks and prismatic guides. The magnitude of castings on some of the heavy machine tools built by this company is aptly illustrated by the weight of the crosshead, amounting to 70 tons, forming part of the largest turning and boring mill in the world. The total weight of this machine, which was finished last year and now stands in the works of J. M. Voith in Heidenheim, Baden, Germany, is more than 770 metric tons or 759 gross tons.

Making the castings for such large parts necessitates long experience in core making. Because of certain specifications regarding condition and quality of metal, the task is made increasingly difficult. When the hardness of sliding surfaces is to be determined, it is important to differentiate between slide (moving) and slide-way (stationary) and to see that the latter has a greater surface hardness than the former. If the reverse is done, the bedplate of a lathe or planer is liable to wear unevenly



The bed of this combined planer and milling machine is a chilled casting. The table was designed to carry work weighing up to 100 tons.

SURFACES OF LARGE MACHINE TOOLS

owing to short stroke motions of the tool slide or table. This disadvantage does not arise from the slide, as the entire sliding area is put under wear irrespective of the length of stroke or travel.

Rough Cast Iron Plates, Not Too Long, Used for Chilling

Because of the influence of heat and subsequent warping it is not advisable to employ long chilling plates. If chilling is to be effective, the plate must remain in contact with the metal over the entire length; otherwise irregular chilling takes place. Vertically-arranged chilling plates of various lengths are also likely to damage the mold when warping. Slabs 2 ft. long and 1 ft. wide are the best.

So far as materials are concerned, cast-iron slabs are cheapest, as their chilling capacity is equal to that of cast or mild steel and they are less subject to

THE chilling of slides and slide-ways of heavy machine tool castings as practiced by a German builder of heavy tools is outlined in this article. Chilling plates of cast iron, unmachined and not too long, are employed. The thickness of the plates ranges from ¼ to 2 in., thicker plates having been found to increase the hardness beyond that economical for machining. Details are given on the molding and chilling of an upright for a large vertical boring mill and there is a brief description of the molding of a bedplate casting for a heavy crankshaft lathe.

The bed of the boring mill shown on page 763 in the course of construction. This member is a chilled casting.

warping. Formerly they were machined, but it soon was discovered that rough cast chilling plates served equally well when the smooth side was turned to the metal. Since the areas to be chilled on large machine tool castings are extensive, the number of chilling plates often is considerable. Fig. 1 shows the manufacture of chilling plates in batteries. The plates are laid rough side downward from $\frac{3}{8}$ in. to $1\frac{1}{4}$ in. apart to allow for expansion when hot.

It was thought inadvisable to increase the space between the plates, because if this were done the portion of the metal not in direct contact with the plates probably would be ineffectively chilled. It is important that an even hardness be secured over the entire length of the chilled surface. Experiments are being continued to determine the most suitable and economical spacing of chilling plates.

Thickness of the chilling plates is an important consideration. It depends upon the hardness of the surface desired, size of surface to be chilled, composition of the iron in the furnace, temperature of the iron when entering the mold and the time required for filling the mold (that is, the rapidity of flow). Chilling plates $1\frac{1}{4}$ to 2 in. thick have proved suitable for average conditions, while plates 2 in. thick are used on castings having walls $2\frac{1}{2}$ to $3\frac{1}{8}$ in. thick. Any further increase in the thickness of the plates tends to increase the chill beyond the desired hardness for economic machining purposes, owing to excessive absorption of carbon by the metal producing white-grained iron. Excessive hardness is not desirable on machine tool castings, whereas it is useful for chilled cast-iron rolls and other parts that do not require machining of the chilled surface.

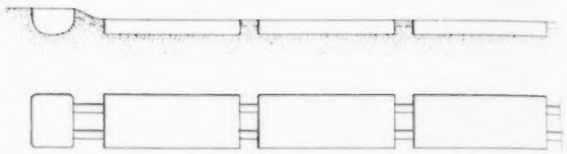


Fig. 1.—Chill plates are made in batteries. Laid rough side downward, they are spaced from $\frac{3}{8}$ to $1\frac{1}{4}$ in. apart to allow for expansion.

Depth of Chill Affected by Silicon

It is interesting to note that the depth of the chill increases in proportion to the decrease of the silicon in the iron. The reverse action is obtained by the addition of manganese and sulphur. It is evident, therefore, that if a considerable depth is required and the metal to be cast is low in manganese, the amount of silicon must necessarily be kept low. As all chilled portions of machine tool castings have to be machined after the chilling process, it is important to observe all points bearing on composition of the metal and thickness of walls and webs that contribute to production of castings satisfactorily hard and sound.

The hotter the metal is when it enters the mold, the greater the hardness effect on the chilled surface. Likewise, a slow flow of metal tends to decrease hardness of the chill. The chilling action continues during solidification. Rapid chilling splits up the graphite into small particles and produces a close-grained iron of bright gray color, while a slow chill encourages the formation of large graphite crystals, which in turn produce coarser-grained iron of dark color. Under the circumstances the metal in the ladle should be fairly hot, but not overheated and should be poured at a moderate rate. To counteract the chilling action so as to avoid too hard a surface, the castings are allowed to cool slowly in the mold, large ones remaining there as long as eight days.

Making 28½-Ton Lathe Bedplate Casting

Molding half of a four-way bedplate casting for a heavy crankshaft lathe is an interesting job. The overall dimensions of each casting in inches are: width 180, length 180; width of each of the four ways $17\frac{3}{4}$, thickness of narrow guides $2\frac{3}{8}$, thickness of

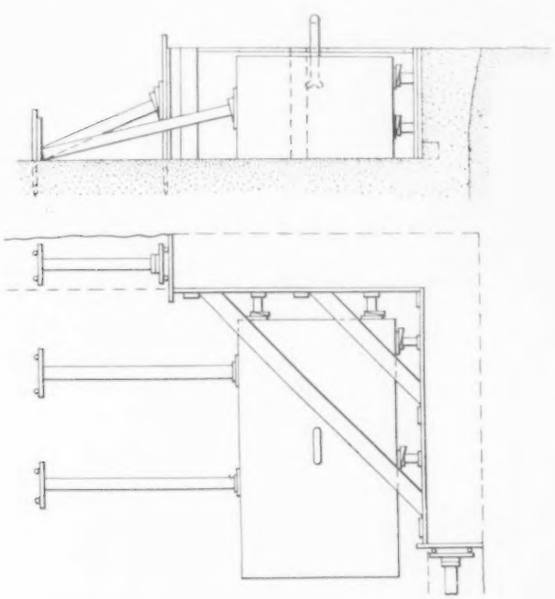


Fig. 3—In molding the corner of the lathe bedplate a molding fixture of boards and bastions was employed.

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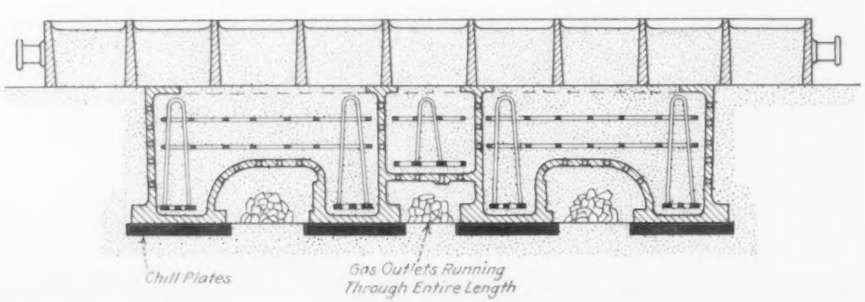


Fig. 2—Section through finished mold of four-way bedplate casting for heavy crankshaft lathe.

main webs and ribs 1⅜ and 1⅛ respectively. The casting weighed 28½ tons. This job called for special knowledge on the part of the molder, as it had to be done with the help of molding boards only, that is, without the aid of a pattern or part pattern.

Fig. 2 shows the section through the finished mold. The next step is the molding of one corner, employing a molding fixture of boards and bastions and a weight for supporting it as shown in Fig. 3. After finishing the corner, the adjoining longitudinal and cross sides are molded piece by piece, using the same fixture and weight as previously. After the walls are finished, the cores are placed and other molding operations are performed. Six pouring apertures are provided at each end of mold; through four of these the molten metal enters at a point almost level with the floor, while through the two outside ones it enters at a point approximately half way up the depth of mold. Further pouring channels are cut horizontally on top of mold. Twenty core sections form the main cores. All cores are molded independently.

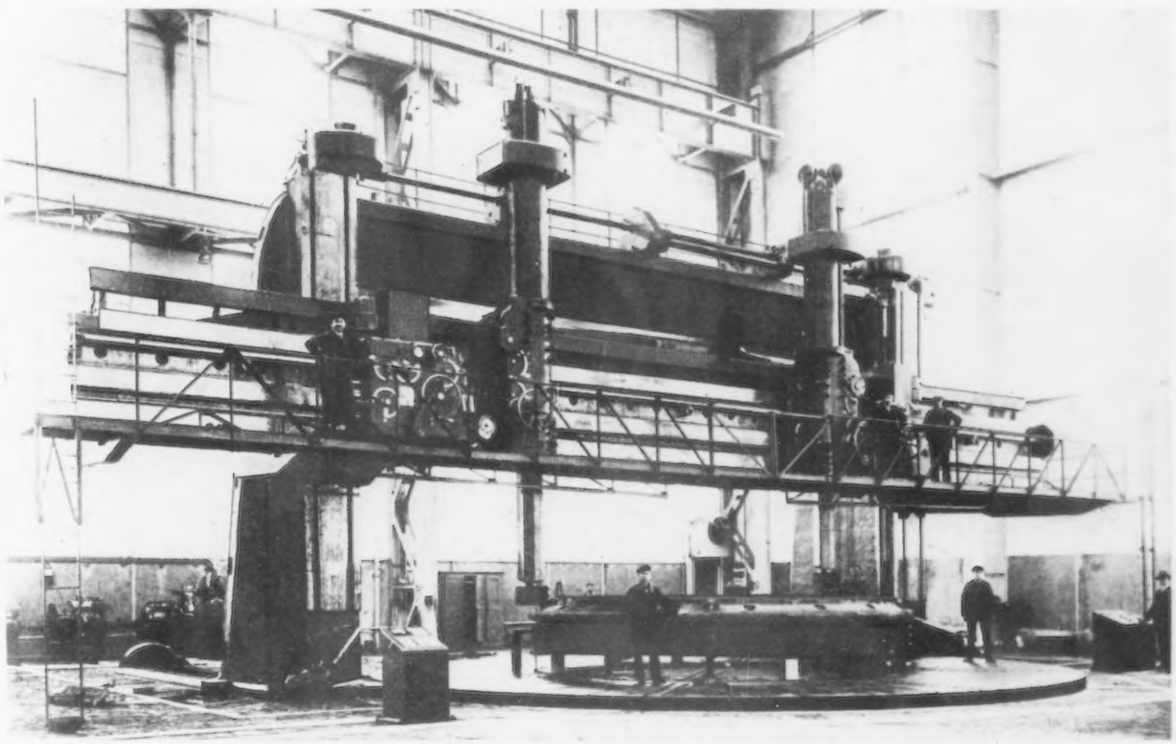
The casting received from the above described mold proved satisfactory, as did the casting of the other half which had been molded in the same way. The cupola charge consisted of 2 per cent silicon, 1 per cent manganese, 0.4 per cent phosphorus, 0.7 per cent sulphur. The analysis of the cast metal showed the following composition: silica 1.69 per cent, manganese 0.84 per cent, phosphorus 0.55 per cent, and sulphur 0.087 per cent.

The transverse strength of test rods from the melt was 2.45 tons; the deflection was 13/32 in. (9.5 mm.). The tensile resistance was 14.4 tons per sq. in. The bending test was carried out on machined rods of 1¼ in. dia. and the distance of supports was adjusted to 23.6 in. (600 mm.). The fractured rods were then turned down to 25/32 in. diameter (20 mm.) and subjected to the tensile test.

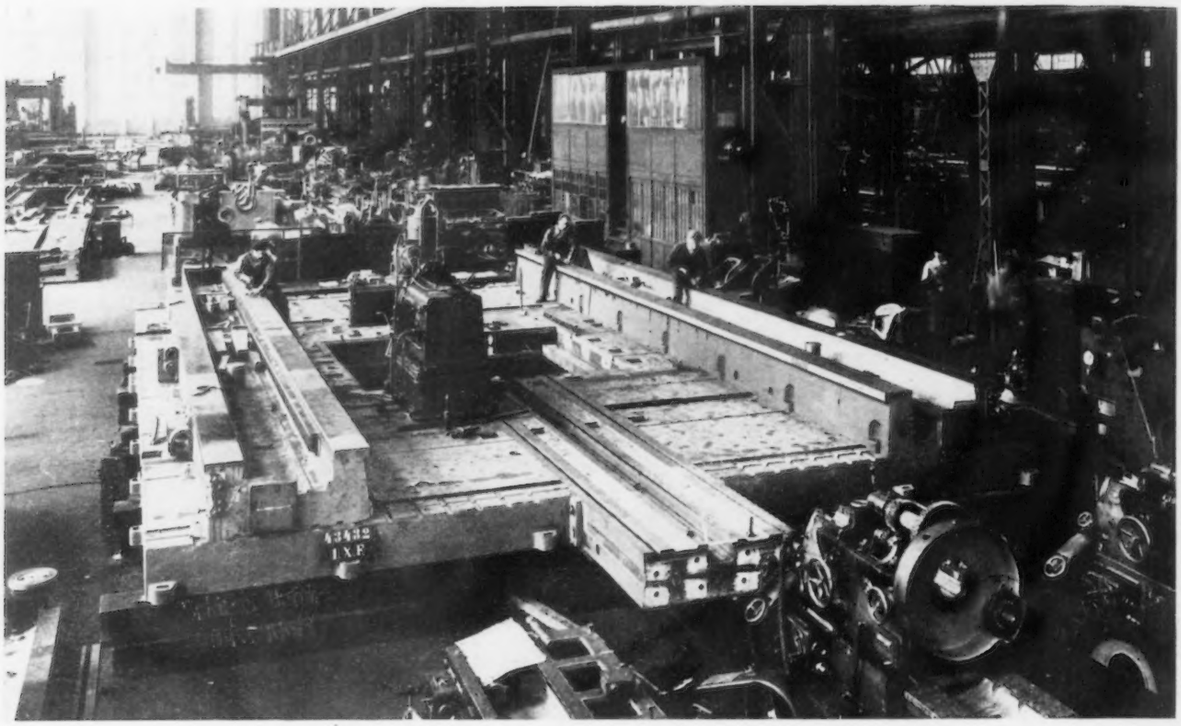
Arrangement of Chill Plates for Upright of Large Boring Mill

The molding of an upright for a vertical turning and boring mill for a maximum turning diameter of 8 ft. 2 in. presents another interesting problem. In this case the chilling plates are arranged vertically, as may be seen in Fig. 4, and are intended to chill the prismatic guide portion of the upright to which the crosshead is fastened. Fig. 4 shows a section through the finished mold taken along the center line of the lowest circular core and parallel to the base of the upright. The circular main cores are made in halves, being divided horizontally for inserting purposes. The chilling slabs are usually inserted in the following manner: After the pattern is arranged in the pit, a wall is molded along it against which the slabs can stand up. In the procedure of finishing the mold, the slabs are rammed up tight to the pattern. To secure their hold in the mold they are provided with cast-in mild steel hooks, as indicated in Fig 4.

It was proved not advisable to blacken the chilling plates with the same graphite solution employed



This boring mill, built last year, weighs more than 1,600,000 lb. and is believed to be the largest ever built. The maximum turning diameter, with the uprights in the forward and in the rear position, is 39 ft. 5 in. and 59 ft. ¾ in., respectively. The maximum height above the table surface is 16 ft. 5 in. There are two tables, an inner and an outer, the capacity of which is for work weighing 200 metric and 100 metric tons (197 and 98 gross tons) respectively. These tables may be used independently or coupled together and operated as one table.



Finishing the bed of a large milling machine of the Schiess-Defries works.

for the mold. The particles of graphite do not adhere to iron in the same effective way as to sand, being likely to separate when coming in touch with molten iron, thus producing scars.

Good results have been achieved by coating plates with core paint known as Hexolit. Special care should be taken to see that the chilling plates are dry. Even a small amount of moisture may cause the formation of vapor and induce so-called "boiling." It likewise is important to make sure that the plates are free from rust.

To reduce any undesired amount of hardness on the chilled surface, chilling plates should be heated previous to filling the mold with metal. This procedure is, of course, only applicable in cases where it is possible either to assemble the mold quickly enough to prevent extensive cooling of plates, or to molds of such shape permitting the heating up of plates in place (hot air admission, placing of pieces of red hot iron, etc.).

With the large molds described above, the practice is to shorten to a minimum the time between the drying of mold and pouring of metal in order to prevent the cooling down of the interior to such an extent as to create conditions conducive to the formation of moisture. Moreover, the heat radiation of the hot metal on entering the mold tends to raise rapidly the temperature of the chilling plates. These circumstances allow a gradual rise in temperature of all parts of the mold before coming into contact with the liquid iron, thus preventing such damage as might otherwise be caused.

The process of solidifying the iron in the mold is no longer mysterious to the experienced foundryman who, with a little experience, soon will be able to adapt these methods of chilling to any special purpose. The moderate expenditure for stocking chilling plates will pay for itself by improving the castings turned out. This is of particular importance to the machine tool builder.

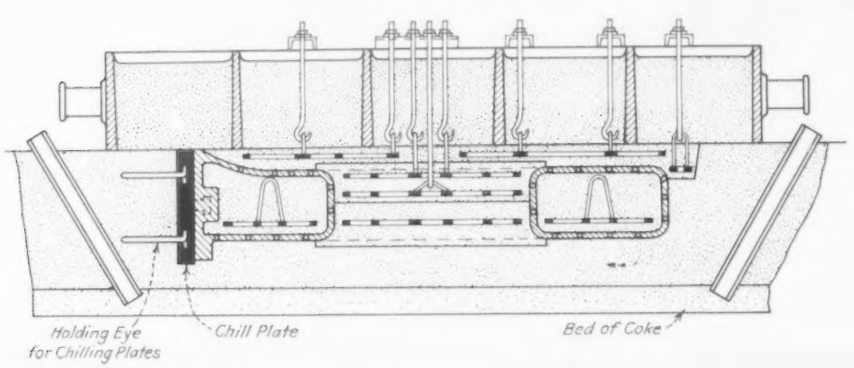
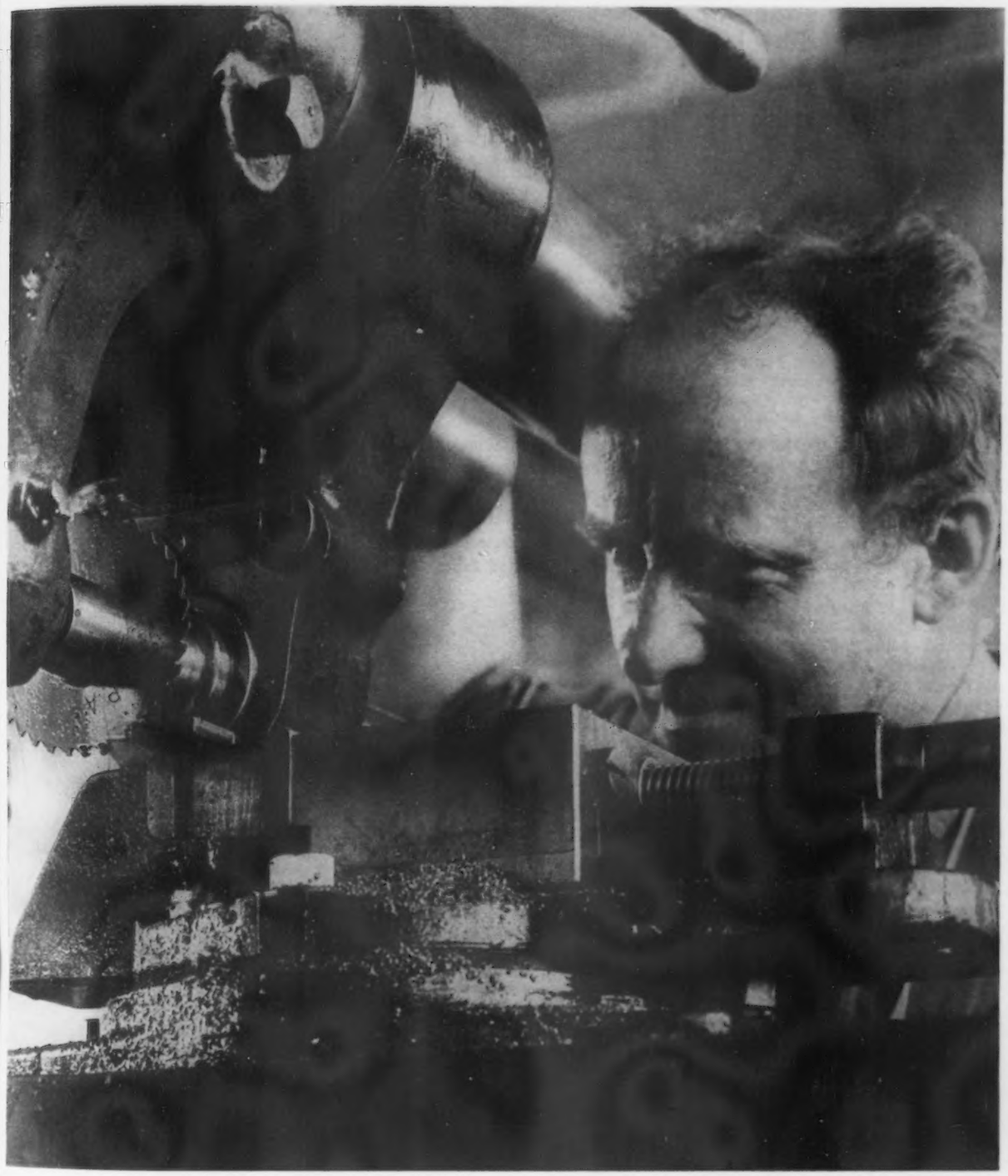


Fig. 4—The chill plates for the boring mill uprights are arranged vertically and are intended to chill the guide portion of the upright to which the crosshead is fastened.



HE'S interested in what he's doing. For he knows that the autogiro control part he's making is a strategic element both as regards the success of the mechanism and the safety of the prospective flyers. Reading of each new aircraft achievement, he realizes the high contribution of the machine shop, and in working on this part his mind easily fills out the picture even to flight and its human aspects. Thus, he knows what it is all about and he feels responsibility; his interest is fully engaged.

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VARIATIONS IN WALL THICKNESS OF PIPE MEASURED ELECTROMAGNETICALLY

By DR. A. V. DE FOREST
Magnetic Physicist, Welding Engineering & Research Corpn., New York

MEASURING variations in wall thickness of pipe and tubing is now possible by a new electromagnetic method called the isothermal test. Heat generated in a conductor is used to measure the local cross-sectional area. Walls of jacketed cylinders, compressed gas containers, stills and tubes can be measured also.

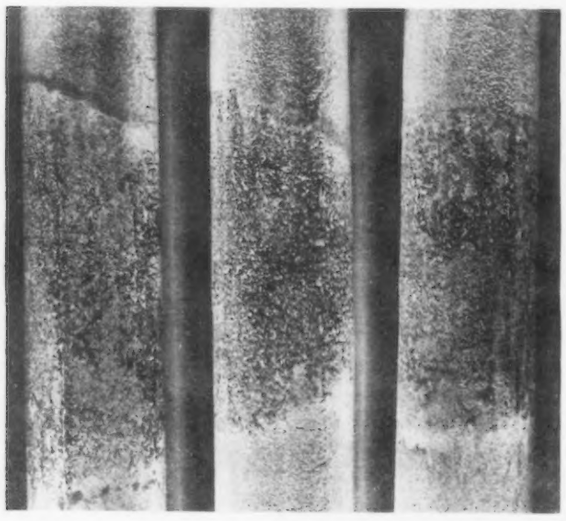
A SIMPLE and novel type of electromagnetic test attracted attention at the recent exhibit of the American Society for Testing Materials in Chicago. Instead of measuring electrical quantities by means of galvanometers, oscilloscopes or other direct methods, this process uses the heat generated in a conductor as a measure of the local cross-sectional area. In the application exhibited by the committee on magnetic analysis of the society the circuit is formed by a pipe wall, and the test indicated the degree of non-uniformity of the wall thickness.

The Walworth Co. holds an exclusive license in its field and utilizes this test to check the concentricity of its C.N.I. cast pipe. The middle of the rough casting is rubbed with solid stearine leaving a whitened surface as though rubbed with chalk. This portion is heated by induction from a surrounding coil and a band of stearine is melted around the pipe. The melted band is dark, exactly as is melted snow over a steam pipe under a city street, and the junction between the melted and solid material forms a constant temperature or isothermal line. If the wall is uniform the width of the band is the same all around. If not, the thin portion of the wall heats first and the band is widest at that point.

Variation in width of the band is regulated by the shape and size of the magnetizing winding and after these are fixed, may be calibrated in terms of wall thickness. In one illustration the difference in wall thickness from the thin to the thick side is 25 per cent in the two defective samples. No measurement is necessary, as the variation in wall is easily estimated from the angle between the isothermal line and the axis of the pipe.

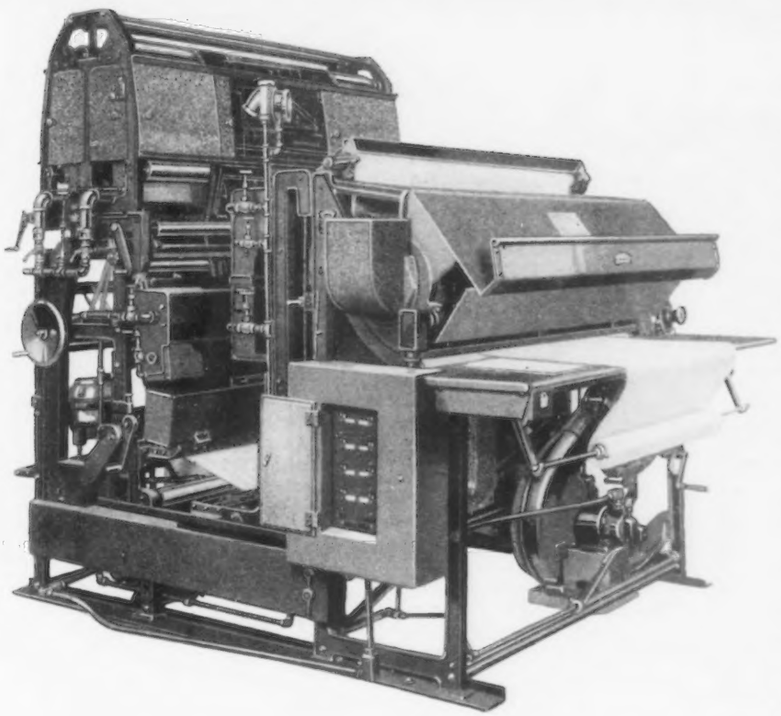
In the case of seamless tubing, studies were made for Spang, Chalfant & Co., Inc. There are usually less regular variations in wall thickness in such material. The other illustration shows the appearance of such a test. In this case there are four relatively thick and a corresponding number of thin portions. In section the outer wall is circular and the inner a square with rounded corners with a difference of 6.2 per cent between the maximum and minimum wall.

The test may be used both on magnetic and non-magnetic metals, as it depends upon conductivity. Other problems may be solved by this method, such as the thickness of jacketed cylinder walls, wall thickness of compressed gas containers, wall thickness of still and boiler tubes in place. The test has been studied in regard to welds, but is most useful where the variation in conductivity is distributed over a considerable area. In principle, the method is not limited to the use of a melting point as a temperature indicator, but can be used with any of the more ordinary methods of measurement.



CAST iron pipe (left). Right hand sample shows concentric wall with isothermal line normal to axis. Center and left hand specimens defective.

SEAMLESS tube (at right) showing four maximum and four minimum points of wall thickness.



Blueprinting Equipment Gives Speeds Up to 12 Ft. per Minute

NEW equipment for continuous blueprinting, designated as the Peerless Model 25, has been placed on the market by the C. F. Pease Co., 813 North Franklin Street, Chicago. It comprises three units—blueprinting machine, washing unit, and potashing, washing and drying machine. The printing unit can be operated independently of the developing and drying equipment, installation of which may be deferred until required to increase the capacity.

All units are made in two sizes, 42 and 54 in. wide, and can be wired to operate on 220-volt alternating or direct current. The 54-in. machine has seven arc lamps, the smaller machine being equipped with six lamps. All lamps are mounted in horizontal alinement to give uniform light distribution and fast printing speed.

Tracings are placed face up on the paper which feeds from a roll at the front of the machine. They are carried upward around the contact glass, past the lamp bank and are automatically returned to the operator. The prints on the continuous strip are carried to the subsequent operations of washing, potashing and drying. When making single prints, both the tracing and the paper are returned to the tray at the front.

A speed range from 4 in. to 12 ft. a min. is provided. The ¼-hp. driving motor is of the variable-speed type and a gear shift underneath the table gives high and low speeds, also neutral. Accurate regulation is obtained by means of a hand-operated dial and rheostat.

The washing unit subjects the paper to a double wash under pressure spray. After this the prints pass to a chemical applicator roll set in a shallow tray into which potash or "hypo" solutions are fed automatically from a container at the rear. These solutions can be alternated as required for the class of work being produced. Following the developing process, the prints are washed by another spray and pass to the dryer.

The air-type dryer has two banks of heating units between which the paper travels around a floating idler roll that can be raised and lowered by means of a crank-handle when threading the machine. Either gas or electric heating can be supplied. When the drive motor is shut down, the heating units are cut off automatically. A feature of the dryer is the special side doors and sliding panels which assist the operator to overcome the difficulties in humidity and still enable him to see the finished prints as they pass over the dryer to the rolling up device at the rear.

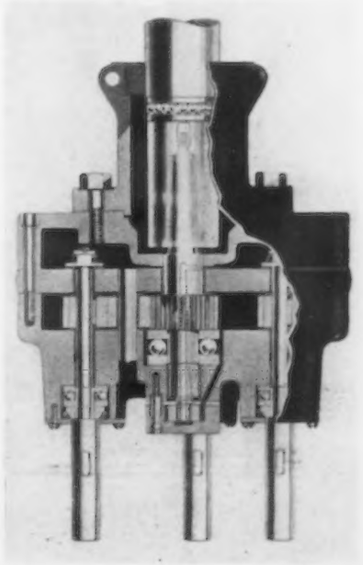
The framework is of gray iron and the machine is finished in olive green enamel paint. Overall dimensions of the complete 54-in. equipment with gas heater are 6 ft. 11 in. wide x 7 ft. 9¾ in. x 7 ft. 3 in.

Pioneer Multiple-Spindle Drill Heads

FORCE-FEED lubrication is an improvement incorporated in new multiple-spindle drill heads brought out by the Pioneer Engineering & Mfg. Co., 8316 Woodward Avenue, Detroit. All moving parts are flooded with oil supplied by an eccentric pumping mechanism built integral with the head. This pump, which has only two moving parts, is a Rollway self-priming unit manufactured by the same company. It is entirely inclosed and is driven by the main drive shaft or through an idler shaft as required by the design of the head. Oil passes from the pump through a longitudinal passage in the driving shaft from which it is sprayed over the entire mechanism.

The spindles are mounted in bronze bushings, ball bearings being employed to take only the thrust loads. For special high speed applications, however, the drill heads can be supplied with ball bearings throughout.

All spindle bearings of the Type A head, here illustrated, are of the same diameter. This feature makes for standardization and simplification of details and is especially suitable where close centers or staggered gear construction is necessary. Type B heads are designed for applications where a minimum of head space is available. Both types are built with any size, type or number of spindles as required and to take drills from No. 60 to 1 1/16-in. diameter. Three types of spindle noses are obtainable: plain, tapping and adjustable. The adjustable spindles facilitate drilling to an exact depth of hole.



Spindles have bronze bushed bearings above and below the driving gears. A built-in oil pump provides force-feed lubrication.

Belt Sander for Metal and Wood Surfaces

OLIVER MACHINERY CO., Grand Rapids, Mich., has brought out a motor-driven belt machine for sanding and polishing sheet steel aluminum, bronze and other metal as well as wood surfaces, both flat and slightly curved. As shown in the accompanying illustration, the sander comprises three separate units: a driving pulley stand with direct-connected, 2-hp. ball-bearing motor; a work table, measuring 32 x 96 in. and having a vertical adjustment of 14 in.; and an idler stand, which has a 20-in. diameter solid aluminum pulley of the same size and type as the driving pulley. The table has a horizontal movement of 36 in. on ball-bearing wheels which rotate on steel tracks.

By increasing the distance between the pulley stands, belts of any desired length may be employed. Slippage of the belt is avoided because its sanded surface contacts with the pulleys which are faced with a thick layer of live rubber. The idler pulley has a pressure-lubricated ball bearing supported by a swinging bracket and is provided with universal adjustment for tracking the belt.

A slotted-fork arm bracket, bolted to the base of the idler stand, can be used to carry special pads or idler attachments in connection with special form sanding. As with other machines of this type, molding may be sanded by means of a thin fabric belt, folded to suit the shape of the molding and applied by using a hand-grip that is a counterpart of the molding itself. Among other special applications, the machine has been fitted up for sanding automobile fenders. Floor space requirements are: Width, 3 ft. 10 in.; length, 13 ft. overall at the shortest set-up.

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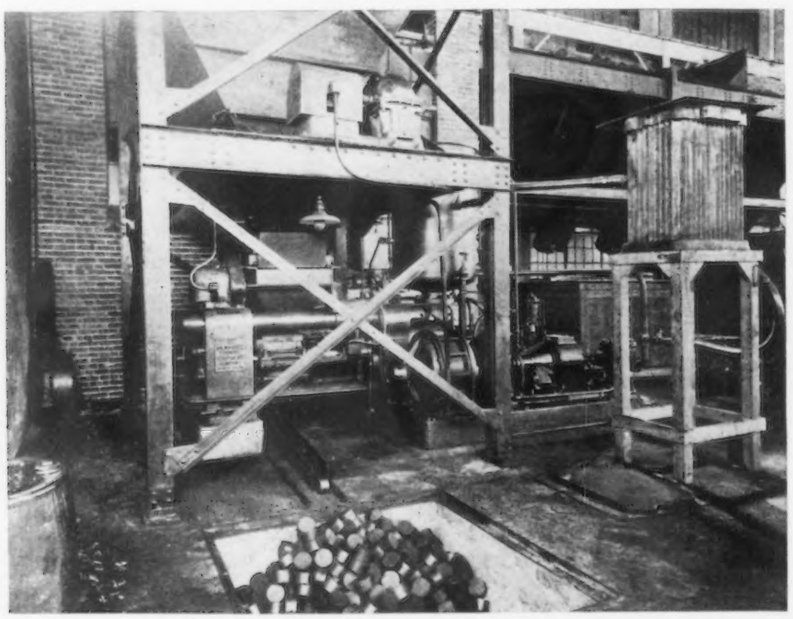
Briquetting Machine for Cast Iron Borings

CATERPILLAR TRACTOR CO., Peoria, Ill., has recently installed a 2-ton capacity briquetting machine for cast iron borings which was designed and built by the Milwaukee Foundry Equipment Co., Milwaukee. This machine operates under 1500 lb. oil pressure, which is furnished by an Oilgear pump driven by a 50-hp. motor. The oil circuit is closed and no accumulator is necessary. As the stroke of the machine is not fixed but reverses at a fixed pressure, each briquette is subjected to the same pressure irrespective of length. The briquettes have a density of approximately 80 per cent of cast iron.

This machine has been in operation for a sufficient length of time to determine cost, which is about $1.27 per ton, including depreciation and interest as well as labor and power.



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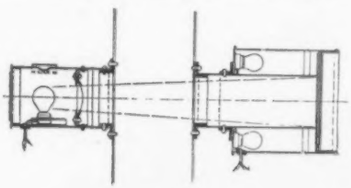
Continuous Indicating Smoke Gage

TO provide a simple, rugged gage for determining the density of smoke passing through a breeching, stack or boiler flue, the Sales Corpn., Richmond, Va., is manufacturing the "Smokometer" which consists of a projector that throws a beam of light across the smoke passage to an indicator mounted on the opposite side. Smoke particles in the path of this beam form shadows on the central screen of the indicator which is surrounded by illuminated sectors gradu-

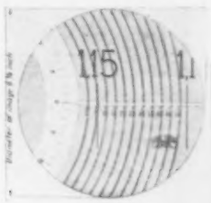


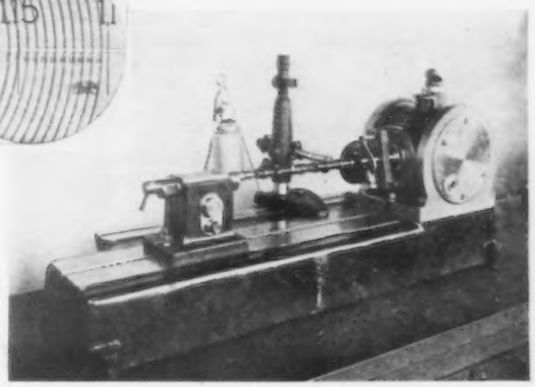
ated in accordance with the Ringlemann density scale. By comparing the illumination of the central portion with the graduated sectors, a continuous indication of the smoke density is obtained.

The accompanying sketch illustrates the construction of the instrument and the design of the indicating screen. In cases where the instrument cannot be mounted in the direct line of vision of the fireman, a reflection of the indicator front may be thrown to any convenient point by means of mirrors. It is to be noted that these are not periscopic mirrors, placed between the source of light and the image screen, which might be sensitive to focus or dirt but that the completed smoke shadow together with the density screen is thrown as one image by the mirrors.

If necessary, instruments may be mounted at any desired point and samples of the smoke brought to them by means of an aspirator. This permits a number of instruments to be mounted on a panel with other boiler-control instruments. The gages are made in two sizes, with 6-in. and with 12-in. dials.

Optical Device Checks Accuracy of Cams





INSERT shows view through ocular; reading indicated is 1.1566 in.

RAPID and accurate checking of the cams of automobile and similar camshafts is facilitated by a new Carl Zeiss instrument introduced to the American market by George Scherr Co., 128 Lafayette Street, New York. As shown in the illustration, the camshaft is held between centers of an optical dividing head and a tailstock. The dividing head reads directly to 1 min.; estimates to 20 sec. may be made by eye. Errors of angular setting will not exceed 5 sec., it is claimed.

A measuring microscope is provided for determining the rise and fall of the cams at various angular settings of the camshaft. Contact with the cam is made by an anvil of the same shape as the head of the valve stem to be used with the camshaft. The anvil is carried by a plunger arranged to move freely in and out in triple roller bearings under a uniform pressure that can be varied if required. The plunger travels in a plane with the axis of the centers and parallel to the surface plate.

Measurements are obtained directly from a scale without the use of standards or masters. The scale, which is mounted on the plunger, is graduated to 0.05 in. Further division to 0.00005 in. is made by a spiral micrometer ocular, the entire reading being obtained in the same ocular.

After one cam has been checked, the measuring microscope is moved along the T-slot in the base to the proper position for checking the next cam. The distance between centers of the instrument as regularly supplied is 20 in.; bases having T-slots and scraped surfaces providing for a 60-in. range may be obtained on special order.

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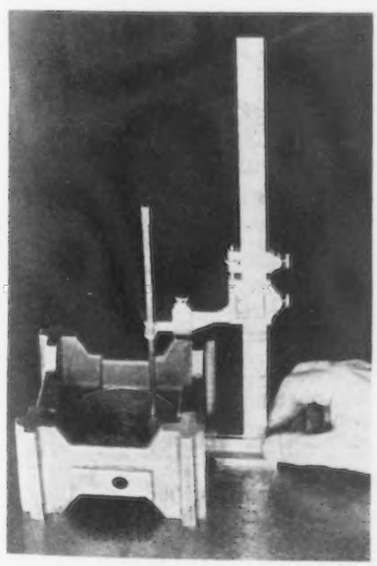
Depth Gaging Attachment

CONVERSION of the No. 585 vernier height gage made by the Brown & Sharpe Mfg. Co., Providence, R. I., into a convenient and accurate depth gage is possible by means of attachments Nos. 585A and 585B, offered by the company for use with the 10 and 18-in. gages. The attachment is easily locked into place by tightening a clamping screw. It is used as shown in the accompanying illustration; measurements can be taken accurately over high projections and in deep recesses.



Brown & Sharpe height gage converted into a convenient depth gage.

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Punch and Shear Handles Light Iron Work

TO the line of combination punch and shear machines manufactured by the Henry Pels & Co., 90 West Street, New York, has been added the smaller type MK-10 unit shown in the accompanying illustration. Similar to the company's larger machines, it is designed for shops handling light ornamental iron work, automobile body or metal sign work; also for welding shops, plant maintenance departments and machine shops.

Capacities are ample for many shops of this type; the machine will cut angles and tees up to 3 x 3 x 5/16 in., square, and 2 x 2 x ¼ in., miter. It will cope and notch 3 x 3 x 5/16-in. angles and will shear ⅜-in. plate of any length or width. Legs of angles can be trimmed under the plate shear knives. Holes can be punched up to ¾-in. diameter through ⅜-in. plate, or ⅝-in. through ½-in. plate. The bar and angle cutter will handle 1-in. rounds or squares and, with special knives, beams up to 4 in. x 8.5 lb. can be cut.

As with the company's larger machines, the punch and the shear elements can be used independently and simultaneously so that two men can work at the machine without interfering with each other. The roller bearing equipped flywheel shaft runs at 600 r.p.m. Bronze pinion and forged gears with cut teeth are employed. A hand lever permits setting down the punch for accurate spotting. The coper can be operated either by foot trip or hand lever. The frame is made of rolled steel plate, specially heat-treated.

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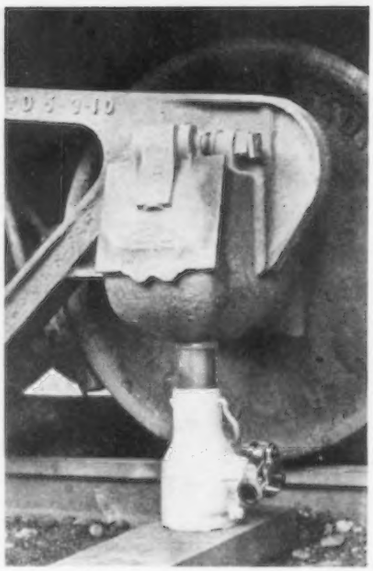
Orders were placed in July for 816 steel boilers of 687,058 sq. ft., against 818 of 677,434 sq. ft., in June, according to reports received by the Bureau of the Census from 73 identical manufacturers. Orders in the first seven months of the current year totaled 4725 boilers of 4,656,946 sq. ft., against 7761 of 8,682,854 sq. ft. in the corresponding period of last year.

Journal Jack Has Light Aluminum Alloy Housing

TWO sizes of light weight journal jacks having capacities of 15 and 25 tons have been placed on the market by the Duff-Norton Mfg. Co., Pittsburgh. They are intended for use by car inspectors as well as for general industrial and contractors' service. Both models are equipped with the Duff-Norton positive-stop safety feature, which is designed to prevent the lifting standards from becoming disengaged.

The new jacks weigh approximately 40 per cent less than the company's former models; the 25-ton jack weighs only 26 pounds and the smaller size jack, 19 lb., or approximately 1 lb. per ton of capacity. The saving in weight is obtained through the use of a heat-treated aluminum-alloy sand casting as the housing for the steel lifting mechanism. It is pointed out that this shell is highly resistant to atmospheric corrosion and to the corrosive action of sulphur and other fumes. The steel mechanism of the jack is packed in grease and is thoroughly protected by the corrosion resisting housing. Destruction tests of the jacks indicate a safety margin at least 25 per cent more than the rated capacity.



Cast aluminum housing protects working parts of the jack and reduces weight to approximately 1 lb. per ton of capacity.

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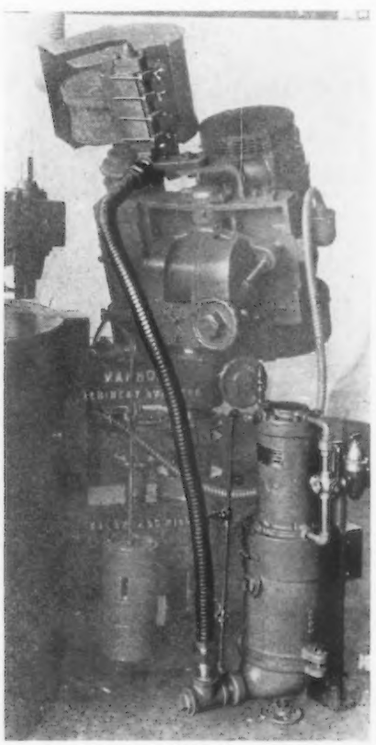
Polishing Paste Applied Automatically

AN automatic feeding attachment for applying composition to polishing and buffing wheels of full automatic, semi-automatic and hand polishing lathes has been placed on the market by Hammond Machinery Builders, 1600 Douglas Avenue, Kalamazoo, Mich. Advantages include economy of polishing composition as well as savings of time in its application to the wheel.



The method of installing the device on a polishing machine is indicated in the accompanying illustration. The feeder is operated by compressed air and delivers the composition paste through a distributing nozzle directly to the polishing or buffing wheel of the machine. A collector pad, clamped to one end of the nozzle, presses against the polishing wheel and serves further to distribute the polishing material. The adjustable discharge spout with which the feeding nozzle is equipped may be changed to suit polishing or buffing wheels of flat, curved or irregular contour. The nozzle is supplied in sections and can be built up to lubricate any width of wheel.

The proper amount of composition can be fed to the wheel continuously or intermittently as required. For intermittent feed, either hand or foot control may be employed. Various types of polishing composition in paste form may be obtained in drum containers for use with the feeding unit.

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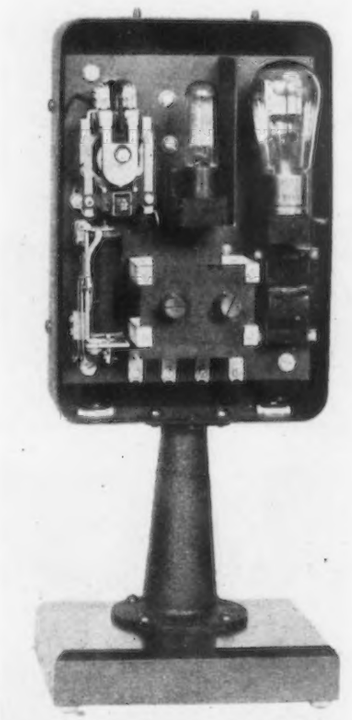
POLISHING material contained in the pressure receptacle is forced by compressed air through the flexible hose to the applicating nozzle at the buffing or polishing wheel of the machine.

Automatically Controlled Indoor Lighting

INDOOR lighting equipment is turned on or off automatically, as required by variations in the intensity of natural illumination, by means of the light-control relay unit illustrated, a recent development of the General Electric Co., Schenectady, N. Y. Photoelectric and pliotron tubes are used; auxiliary equipment includes two potentiometers, adjustable from the front of the case; a sensitive relay, and a normally-open contactor with two insulated, single-pole interlocks; also the necessary transformer, resistors, etc.

One of the potentiometers is for adjusting the equipment to turn on the lights whenever the daylight illumination has diminished to a predetermined intensity. The other potentiometer is adjusted to compensate the unit for the additional illumination which will fall on the photoelectric tube when the artificial lights are turned on.



The relays, which are designated as No. CR7505-D3, are obtainable to operate on 110 or 220 volts at 25 to 60 cycles. The contactor is rated 15 amp. at 110 or 220 volts, a.c. Ten watts or less are drawn when the contactor is open, and approximately 20 watts when it is closed.

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Atlas Machinery & Supply Co., St. Louis, has removed its offices to 526 North Vandeventer Street.

OFF THE ASSEMBLY LINE

October Rise in Automobile Output Depends Largely on Ford Plans

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DETROIT, Sept. 14.

DEVELOPMENTS in the past week give little indication of better performance by the automobile industry in the next 30 days. Whether production this month dips to a new low point for the year depends on how many cars are assembled by the Ford Motor Co., but the consensus of opinion is that Ford's output of the present model A will not be sufficiently high to put the month on a par with August. Looking ahead, one can discern very little promise that October will bring an upturn in the production curve, which has been going downward without interruption since April. Chevrolet will be busy tooling up for 1932 models, with its various plants closed at least part of October, so that it will contribute little to the month's output. Moreover, there seems slight possibility that Ford will be doing much on its new car until the latter part of October; thus, its assemblies which are included in the month's figures are likely to be comparatively meager.

The third largest factor in the industry — Plymouth — probably will show a decline in October compared with September, if for no other reason than a seasonal drop in sales. Other companies are destined to be immersed in preparations for new cars with actual production of models for dealers' stocks not likely to get under way until close to Nov. 1. Under the circumstances, the steel trade is hopeful that their customers in the motor car field will speed up their programs so that tonnage releases will aid the steel mills late in September or early in October, but privately they admit that there is little chance of major releases of steel for consumption in this district until at least the middle of next month.

With the realization of their hopes deferred, Detroit steel men are perhaps unduly pessimistic just now. Even with the automobile industry swinging into the manufacture of new models late in the year, they see only moderate gains in tonnage with the total volume not large enough to boost the operating rate of mills except for a brief period. This opinion is expressed, of course, with knowledge of the fact that it is virtually impossible to predict what is going to happen in the industry more than a few weeks ahead and with the fervent wish that the turn of events in the next month will be more favorable than now seems likely.

There is very little promise that October will bring an upturn in the automobile production curve, which has been going downward without interruption since April.

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Few steel releases expected from automobile industry before middle of October. Ford is not expected to make steel purchases for new car until next month.

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Ford Motor Co. has added 30,000 men at Rouge plant, bringing total employment there to 65,000 men. By end of September it is expected number of workers will stand at 86,000, a high mark for the year.

* * *

General Motors' sales to consumers in August exceeded sales to dealers. In first eight months of 1931, General Motors produced 881,724 cars, or 44 per cent of the industry's total, compared with 929,805 in the similar period of 1930.

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Many steel men are hanging their hopes for improvement on a resumption of buying on a considerable scale by the Ford Motor Co. It is true that in the past two weeks Ford has placed small tonnages to balance items in finishing up production on current models, and likewise has released minor orders for steel for experimental work on new parts for the forthcoming car, but actual purchasing of steel for manufacture of the new models is not expected until some time in October. A week ago it was believed that some releases might be given before the end of September, but apparently work on the new car is coming along less rapidly than the trade had expected. Last Tuesday it was reported that 28,000 to 30,000 men resumed work at the Rouge plant, bringing the total on the Ford payroll at Rouge to 65,000. It is said that before the close of the current month some 50,000 employees will have been recalled, thus raising the number of employees to 86,000, which would represent the peak of the year. It must be remembered, however, that a large majority of these men are working part-time, at present two to three days a week, so that production will not be so large as the total number of men would lead one to believe. It is understood that some of the details of the new motor and transmission have not yet been decided upon and that other problems in connection with the revamped car must be solved before much in the way of production is done.

One Ford blast furnace is operating on basic iron this month, and when the Ford open-hearths are again fired they will be using cold instead of hot metal. It is said that Ford's stock of pig iron at Rouge now is close to a quarter of a million tons, and fear has been expressed that some of it might be thrown on the merchant market. However, people close to the Ford organization are inclined to discredit

this idea, believing that Ford will be able to make use of this tremendous stock of iron when manufacturing activities get under way. It is pointed out that the Ford company generally carries a relatively large tonnage of iron in its yards and that the swelling of the volume to abnormal proportions is due to a temporary situation which will right itself.

In view of reliable reports available about Ford's present status and in spite of stories predicting public announcement in the near future of a new car, it seems more likely than it did at the beginning of the month that the new Ford will not be put on the market much before the end of the year. In fact, its appearance may coincide with the public display of the 1932 Chevrolet. It is not known what this month's output of the Chevrolet company will be. September is "clean-up" month on current models and October will be given over to preparations for the new car. For at least two weeks in October the Flint factory as well as the gear and axle plant and the forge department in Detroit will be down for retooling. The foundry at Saginaw may be closed the latter part of September. It is stated that the various Chevrolet divisions this year will have little more than a month in which to get ready for next year's operations, whereas last year they had two months.

Trend Toward Low-Priced Cars

Detroit believes that Plymouth, sensing unusual interest on the part of the public in its new car and realizing that it must do something to stay in the picture when Ford and Chevrolet come out with new models, is having body dies made for a complete new body to be offered at show time. There is little doubt in the minds of observers that Plymouth will remain during next year a strong contender in the low-priced field, although its total volume is not expected to approach that of either Ford or Chevrolet. Hudson has been working for some time on a new car, and the story is that a light six may be offered to compete more strongly with the three leaders in low-priced cars. Along this line, it is said that leaders in the automobile industry are convinced that during the next few years there will be a greater trend than ever before toward cheap transportation and that this probability may lure some of the medium-priced manufacturers into the lower price class. About 75 per cent of retail sales this year have been in the Ford and Chevrolet class and this percentage may be shoved up to a higher figure next year. It is pointed out, however, that Ford, Chevrolet and the Chrysler-owned Plymouth have unusual resources and are in a firmly entrenched position from which it will take almost herculean effort for a newcomer to dislodge them.

About other manufacturers little is available except of a routine nature, such as the monotonous repetition of production figures. Without exception all of them are operating at a comparatively low rate. The National Automobile Chamber of Commerce estimates that output in August was 197,030 cars and trucks, or 12 per cent less than in July and 16 per cent under the figure for August, 1930. Production for the first eight months of this year is put at 2,054,781 units, a drop of 28 per cent from the corresponding period of last year. It now looks as though output for the entire year 1931 will be 2,700,000 to 2,800,000 units, although it is hazardous to venture a guess on account of uncertainty of Ford's plans.

In August the sales of General Motors to consumers, at 69,876 cars, exceeded those to dealers, which were 62,667 cars. Total sales to dealers in the United States and Canada, plus overseas shipments, were 70,078 units, compared with 85,610 units in August, 1930. It must be remembered that last year the figures were enlarged by the fact that the Buick Motor Co. was in production on a new car, whereas this year it was completing the assembling of current models.

General Motors' output in August represented 35 per cent of the total. Of the 70,078 cars shipped in August, Chevrolet accounted for 54,958 cars, leaving 15,120 cars produced by the remaining three divisions—Oakland-Pontiac, Oldsmobile and Cadillac-La-Salle. In the first eight months of 1931, General Motors turned out 881,724 cars, or about 44 per cent of the industry's total. During the similar period of 1930, production was 929,805 cars.

Chrysler Steel Orders Pending

The Chrysler Corpn. has not yet placed its fourth quarter contracts for steel, although action is expected at any moment. Hudson likewise has not bought steel as yet. Sheet and strip makers are watching the Chrysler business anxiously, realizing that it will provide a severe test of present prices.

One of the most interesting developments in connection with the new Ford is the possibility that rustless steel will be abandoned for the radiator shell in favor of steel, chromium-plated. Rustless steel probably will be used for the lamps and wheel hubs, but a shift from this material for the radiator shell would be a severe blow to rustless steel makers. The Ford Motor Co. has been the largest user of rustless steel, principally because of the large tonnage required for radiator shells.

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Steel Corporation Fails to Make Announcement on Wage Rate

NEW YORK, Sept. 15.—Heads of the subsidiaries of the United States Steel Corpn. met with general executives here today and, according to reports in financial circles, discussed the matter of wage rates. No announcement whatever was given out at the conclusion of the conference and thus Wall Street expectations still remain unfulfilled. The feeling is growing that the local financial community has exaggerated the importance of a wage revision in Steel Corporation plants. In fact, it is beginning to be doubted that downward wage adjustment has really been a matter of major consideration.

It is understood that computations made in various steel plants disclose that a 10 per cent cut in wage rates, under present conditions, would reduce costs no more than 60c. to $1 a ton, depending on the product made. Such a reduction pales into insignificance compared with an average decline in steel prices of close to $6 a ton from the 1929 peak and recessions in individual products, like automobile body sheets, of as much as $20 a ton. Past experience, moreover, indicates that a wage cut might introduce fresh instability into the price structure, with the result that the saving in costs would soon be passed on to the buyer.

Another consideration that has undoubtedly dictated a cautious wage policy is the fact that wage earnings, due to the slack rate of operations and the rotation of jobs, are already very low. The steel industry has made a monumental practical contribution to the nation-wide efforts to reduce unemployment by keeping a maximum number of employees at work. A cut in wage rates could not be made without taking into the account the effect on the status of the individual workers, some of whom are now employed an average of only one day a week, at least in the coal fields. If the problem of combating actual want and distress were not involved, the matter would be a far simpler one.

Steel leaders are naturally skeptical of assurances that a wage cut would usher in a recovery of business. They reason that if price declines running up to $20 a ton have failed to stimulate trade, surely a cut of $1 or even $2 a ton in costs cannot be counted on to turn the trick. Of course, events have a way of deciding many of these moot questions and it is conceivable that if the steel business fails to improve action on wage rates may become unavoidable.

Rates on Southern Pig Iron to North Upheld in Report

Interstate Commerce Commission Examiner Declines to Recommend Increases, as Urged by Northern Furnaces

WASHINGTON, Sept. 15.—Rates on pig iron from Southern producing points to markets along the North Atlantic seaboard are upheld in a proposed report by Examiner Frank C. Weems of the Interstate Commerce Commission.

The report goes exhaustively into complaints by blast furnace interests in the East, including New England. They charged that the rates from the South were unreasonably low, and in this they were supported by Northern railroads. Producers in the South, particularly in the Birmingham and Chattanooga districts, were joined by Southern rail lines in upholding the rates.

The rates cover rail rates from Southern producing points to Gulf and South Atlantic ports and water-rail rates from the ports to the markets in the Northeast.

The examiner also denied the proposal of the Northern furnace interests that the commission prescribe minimum rates from the South. At the same time he rejected the contention that the maintenance of the rates from the South threatens a rate war or will cause reductions in rates of the Northern carriers. The examiner declared that there is no proof that any definite or fixed relationship exists between the rates on pig iron from the South to the various ports on the one hand, and rates on pig iron from the Northern furnaces to Northern markets on the other hand which would necessarily require a reduction in the rates in the North because of the reduction in the rates from the South.

Says Increases Would Invite Diversion of Traffic to Water

He also said that an outstanding feature is the probability, if the Southern rates were increased, of movements from the Birmingham district at low rates by river barge to Mobile, Ala., and thence by ocean to the North Atlantic seaboard. Mention was made of other water carriers that would get the traffic, with the result that, if the rail rate were increased, it would only mean diversion of the traffic to water lines and deprive Southern carriers of revenue with no benefit to either the Northern furnaces or the Northern railroads.

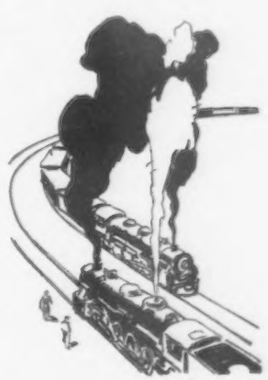
The case was begun through complaints filed in August and October of last year. It was the object of vigorous presentations on the part of the contending forces. The 12 complainants operate 23 blast furnaces with an annual capacity of 3,147,000 tons and were supported by important interveners, including the Bethlehem Steel Co. They charged that the rates are unreasonably low. They contended that they did not ask that such rates be established as will bar Southern iron from markets on or near the North Atlantic seaboard, but sought only such rates as will permit all producers in the North and South to have a fair basis of competition in that market. It was urged by the Northern producers that the reduced rates have given Southern pig iron manufacturers such a position in the Northern market that they have utterly demoralized it as to prices and unnecessarily thrown heavy losses on Northern furnaces and Northern carriers.

Rates Established Aug. 1, 1929

The reduced rates complained of were established on Aug. 1, 1929, typical examples of those from Birmingham by rail-and-water, per gross ton, being as follows:

To	Present Rates	Former Rates	Reductions
Baltimore	$5.00	$5.76	$0.76
Philadelphia	5.25	6.01	0.76
New York	5.50	6.37	0.87
Boston	5.75	6.91	1.16
Providence, R. I.	5.75	6.91	1.16

A table included in the report shows that during the period 1917-1930 the largest annual movement of pig iron from Alabama and Tennessee furnaces to Northern destinations was in the first-named year and totaled 248,741 tons. The Southern production was 3,323,656 tons and output of furnaces in States where the complainants operate was 18,389,994 tons. The Southern movement in 1929 to the North was 86,874 tons, while in 1930, the first full year after the reduced rates went into effect, it was 133,721 tons. The latter figures exclude tonnage of one producer during the last half of the year.



The Southern lines said the reduced rates were established to regain traffic which a few years ago was lost, but which now is substantial and is needed. The Alabama Iron and Steel Shippers' Conference declared that the object of the Northern producers was to preclude Southern furnaces from selling pig iron in the Northern markets, where they sold in large quantities prior to the general increases in rates in 1918 and 1920. Or, the conference said, the purpose was to raise prices of pig iron to a point at which all the Northern furnaces can, in spite of high production costs claimed for some of them, sell pig iron at a profit. The interveners said that Southern pig iron has displaced imported pig iron, not Northern iron.

Rates Alone Not Blamed for Losses of Northern Furnaces

The examiner said that the evidence shows that the prices for Southern pig iron in Northern markets have from time to time forced reductions in prices for pig iron produced at the Northern furnaces. He pointed out that the complainants declared that prices are below those at which efficient Northern furnaces can sell to cover even manufacturing costs, exclusive of overhead costs or any profits and have compelled all Northern furnaces remaining in blast to operate at heavy loss. The examiner declared, however, that such circumstances cannot with fairness be attributed to the rates alone.

In this connection the examiner discussed evidence introduced by the Northern furnaces regarding assembling costs in the South and in the North. This showed the aggregate of transportation costs on inbound raw materials necessary to make a ton of pig iron at Birmingham amounts to $2.07. Against this, costs at Swedeland, Pa., were given as $8; Everett, Mass., $7.99, and Buffalo, $6.22. Consideration also was given to rates on pig iron from Northern and Southern furnaces to consuming points in the North in which Northern furnaces have the advantage. But in view of the lower assembling costs of raw materials in the South, the report said Birmingham's advantage ranged from 31c. to $4.23 a ton. This point was brought out by the Northern furnaces in urging that comparative competitive positions in a market, based upon transportation costs, depend upon total and not partial transportation costs. The examiner said, however, that Southern rail lines are not responsible for total transportation costs regarding Northern pig iron.

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Orders in July for porcelain enameled flat ware were valued at $690,801, against $706,838 in June, according to reports received by the Bureau of the Census from 26 establishments. Orders in the first seven months of 1931 were valued at $4,664,508, compared with $6,004,873 in the corresponding period of last year.

Urges Trade Association as Means of Stabilizing Industry

Group Control of Production and Co-extensive Employee Insurance Proposed by Gerard Swope

A NEW constitution for industry intended to provide lasting relief from hard times was proposed by Gerard Swope, president, General Electric Co., at the annual dinner of the National Electrical Manufacturers Association in New York on Sept. 16. His plan, which has been worked out in detail, contemplates the stabilizing, first, of production and consumption, and, second, of employment.

In introducing his program Mr. Swope said: "Industry exists basically for serving the needs of the people, and therefore production and consumption must be coordinated. Consumption is by the mass of the population, not the few, and the great mass of the population is made up of wage earners and their dependents. That they may be able to buy and satisfy their needs, they must have not only adequate incomes, but must be sufficiently assured of the future to feel that they are safe in spending their money. The psychology of fear must be removed, and this cannot be done unless they have reasonable expectation of protection for their families in case of the breadwinner's death, protection for their old age, and protection against unemployment. By 'protection' I do not mean a protection that is given them, but I mean protection that they themselves help to provide."

Control of Production

Each industry, under Mr. Swope's plan, would establish a trade association to be under the supervision of the Federal Trade Commission, or a bureau of the Department of Commerce, or some Federal supervisory body specially constituted.

These associations would "outline trade practices, business ethics, methods of standard accounting and cost practice"; they would collect and distribute information on volume of business, inventories of merchandise on hand, standardization of products, stabilization of prices, "and all matters which may arise from time to time relating to the growth and development of industry and commerce in order to promote stabilization of employment and give the best service to the public."

Of outstanding importance in the Swope plan is the function of the trade association as the instrument through which industry would exercise control of production. The practices devised and administered by the association in the interest of stabilization would be submitted to the Federal supervisory body, by which their soundness as a social principle would be tested, and to which the public might resort to raise objection.

Companies of an industrial or commercial character having 50 or more employees and doing an interstate business would come within the plan, to which they would be required to adhere within three years unless the time should be extended by the Federal supervisory body.

Protection of Employees

For the protection of their employees, the participating companies must adopt employee plans providing for workmen's compensation, life and disability insurance, pensions and unemployment insurance. If a worker, for some good reason, should leave his original employer, and go into the service of another concern, he would not thereby forfeit his pension, his insurance, his unemployment insurance contributions, or his status under workmen's compensation. This safeguard, Mr. Swope held, would promote the security of the workers and materially aid the stabilization of employment.

The pension provision includes contributions by employees to a minimum of 1 per cent, and approximately equal contributions by the company. The unemployment insurance plan would involve equal contributions by the company and the employee, and payments in times of lay-off amounting to 50 per cent of average full-time earnings up to a maximum of $20 per week. The principle of joint participation and joint administration by management and men in these several employee plans is to be followed.

In addition a general board of administration would be formed by each trade association, this board to have nine members representing the trade association, the employees of the member companies, and the public. The general board of administration would constitute a body of overseers. Its duties, as laid down by the proposed plan, would be to interpret the various employee plans, supervise the individual boards of administration of the various companies, form and direct a pension trust for the custody, investment and distribution of pension funds, and in general direct all activities connected with the employee plans.

"The foregoing plan," said Mr. Swope, "tends to put all domestic corporations of the class described on a parity for domestic business, thereby removing the inequalities of the different laws in the several States, provides for standard forms of financial reports and their periodical issuance for the information of stockholders, and places on organized industry the obligation of coordinating production and consumption and of a higher degree of stabilization.

"This will tend to assure more uniform and continuous employment for the worker and the removal of fear from his mind, allowing him to devote himself wholeheartedly to his task. The cost of the product will include these items and will therefore be paid for by the users of the article or service, and not in general by members of the community who are reached by the vicarious methods of the imposition of a tax."

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Census Bureau Makes Survey of Scrap

The Bureau of the Census, in its first survey of the scrap iron and steel industry, has found that wholesale or carload dealers in all principal cities of 100,000 population or over did a gross volume of about $280,000,000 in 1929. In 93 cities that were surveyed there were 757 wholesale scrap establishments. No account was taken of the large army of individual collectors of scrap nor of small junk yards.

According to the report, Chicago is the leading iron and steel scrap center of the country. Pittsburgh taking second place and Youngstown third. Cities with scrap sales of $1,000,000 or more in 1929 are given in the Census Bureau statement as follows:

City and State	Net Sales	Salaries and Wages
*Chicago	$32,653,970	$905,569
*Pittsburgh	23,542,448	687,341
Youngstown	18,471,616	573,776
*Cleveland	17,944,237	511,310
*New York	17,785,771	731,063
Reading, Pa.	12,236,986	332,034
*Philadelphia	9,853,196	425,116
Canton, Ohio	8,995,325	188,920
San Francisco	8,645,115	508,681
Cincinnati	7,379,448	361,474
*Buffalo	6,659,527	251,982
*St. Louis	6,517,375	125,479
Columbus, Ohio	5,786,758	284,963
*Detroit	5,191,104	168,963
Los Angeles, Cal.	5,091,918	399,364
Rochester, N. Y.	4,928,487	270,176
Indianapolis	4,482,852	231,898
Dayton, Ohio	4,317,565	236,749
Duluth, Minn.	4,243,399	235,304
Newark, N. J.	3,720,257	307,200
Hartford, Conn.	3,653,970	244,077
Kansas City, Kan.	3,610,350	195,817
Akron, Ohio	3,538,438	99,642
Toledo, Ohio	3,313,181	180,661
Grand Rapids, Mich.	3,306,783	294,927
Houston, Tex.	3,284,062	218,572
*Boston	3,144,751	142,880
Oakland, Cal.	2,537,927	304,873
Minneapolis, Minn.	2,273,847	109,317
Providence, R. I.	2,204,738	182,217
Seattle, Wash.	2,098,597	220,371
*Baltimore	2,003,645	118,510
*Milwaukee	1,866,495	125,479
Syracuse, N. Y.	1,846,154	100,069
South Bend, Ind.	1,437,002	99,284
New Haven, Conn.	1,312,182	98,113
Kansas City, Mo.	1,176,551	92,332
Atlanta, Ga.	1,140,483	93,630
Washington	1,122,213	136,781
Portland, Ore.	1,070,585	79,271
Birmingham	1,046,732	108,016
St. Paul, Minn.	1,023,112	48,340
Springfield, Mass.	1,018,577	79,804

*The figures in these cities cover scrap iron and steel exclusively. In all other cities, the figures cover dealers whose major business is scrap iron and steel; sales of other waste materials, which did not warrant a separate classification, are

... PERSONALS ...

E. E. STONE has retired as general purchasing agent of the American Steel & Wire Co., having reached the retirement age under the pension rules of the United States Steel Corpn. His headquarters has been in Cleveland. He has spent 41 years as an employee of the company and predecessor plants. J. N. FLEMING has succeeded Mr. Stone with the title of purchasing agent. He has been connected with the company since its organization and previously was an employee of the H. P. Nail Works, Cleveland. For several years he has been purchasing agent for the Cleveland, Pittsburgh and Chicago districts, with headquarters in Cleveland. F. E. CHESNEY, formerly connected with the purchasing department in Chicago and for the past two years with that department in Cleveland, has been named assistant purchasing agent. D. C. MacDonald has been named as district purchasing agent, with office at 94 Grove Street, Worcester, Mass. The changes became effective Sept. 12.

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ERNST BERNDT, president, Schiess-Defries A.G., Düsseldorf, Germany, arrived in New York last week for a four to five weeks sojourn in the United States. He will visit numerous industrial plants in the company of Ulrich Kauermann, who represents the company with heaquarters in the Fountain Square Building, Cincinnati. Schiess-Defries is a builder of large machine tools for heavy and special work and dates back to 1866.

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CHARLES P. MILLS, director of the chrome alloy department of the General Alloys Co., Boston, has resigned to become chief engineer of Empire Steel Castings, Inc., Reading, Pa. He was for many years chief engineer of the Duraloy Co., Pittsburgh.

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D. A. NEMSER, chief metallurgist, Pratt & Whitney Co., Hartford, Conn., is scheduled to speak at a meeting of the New Haven chapter of the American Society for Steel Treating to be held Sept. 17 at the Hammond Laboratory of Yale University, New Haven. His subject will be "High-Speed Steel."

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C. B. COLDWELL, formerly of the Chicago office of the International-Stacey Corpn., Columbus, has been transferred to the Fort Worth, Tex., office of the company at 1309 Aviation Building.

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IRVING H. JONES, who has been associated with the Crucible Steel Co. of America, New York, has become Western district manager, with offices at 208 LaSalle Street, Chicago, for the Molybdenum Corpn. of America, Pittsburgh.

FRITZ THYSSEN, of Thyssen & Co., Berlin, Germany, and one of the foremost figures in the economic reconstruction of Germany, will speak on Oct. 21 at the friendship dinner in the New Waldorf-Astoria, New York, which will mark the close of the Eighth Conference of Major Industries.

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LLOYD JONES, manager of the Salem, Ohio, works of the E. W. Bliss Co., Brooklyn, has sailed for Europe on a business trip for the company.

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R. B. KITE, who has been identified with the materials handling equipment industry, has been made manager of the Philadelphia office of the hoist and crane division of Robbins & Myers, Inc., Springfield, Ohio.

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FRED R. KANENGEISER, identified for many years with Youngstown district industries, becomes on Oct. 1 president of the Wellston Iron Furnace Co., Wellston, Ohio. The company controls extensive limestone deposits and has cement capacity of 1,000,000 bbl. yearly.

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ANDREW R. JOHNSON has resigned as manager of sheet and tin plate sales, Republic Steel Corpn., Youngstown, to become assistant vice-president of the Weirton Steel Co., Weirton, W. Va. Mr. Johnson has been active in the sale of sheets and tin plate for more than 20 years. He was with Follansbee Brothers Co., Pittsburgh, for a number of years, later going with the Trumbull Steel Co., Warren, Ohio, serving that company for several years as New York district sales manager. When the Trumbull company was absorbed by the Republic Iron & Steel Co., he was transferred to Youngstown and made manager of tin plate sales. Soon after the formation of the Republic Steel Corpn. he was made manager of sheet and tin plate sales.

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A. T. SIMONDS, president of the Simonds Saw & Steel Co., Fitchburg, Mass., was the guest of the Springfield, Mass., chapter of the National Association of Cost Accountants on Sept. 9. Mr. Simonds discussed the general business situation.

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A. L. FREEDLANDER, vice-president in charge of production for the Dayton Rubber Mfg. Co., Dayton, Ohio, manufacturer of belt drives, left Aug. 4 on an extensive trip through European countries, particularly England, France, Germany and Italy. Mr. Freedlander will visit all major motor car manufacturers of Europe as well as the various plants of the Roderwald Co., maker of V-belt drives of the open end or fastener type. The Dayton company has exclusive manufacturing and selling rights for the Roderwald drive in the American continents, which to date is mainly used for railway axle-lighting, on both body-hung and truck-hung types.

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Gray Iron Institute's Convention Planned

W. J. Barrett, Metropolitan Life Insurance Co., New York, a member of President Hoover's commission on unemployment, will be one of the speakers at the fourth annual convention of the Gray Iron Institute, Inc., at West Baden Springs, Ind., Oct. 15-16. He is expected to speak on methods of meeting the unemployment problem.

George L. Willman, Chicago, will discuss methods of merchandising gray iron castings. He has assisted several industries in expanding their markets and developing new markets for their products.

Rate setting and the foundry budget will be discussed at one session. At a technical session there will be discussions on "Standard Practices and What They Mean to the Industry;" "Gray Iron Castings and Modern Design," and "Proper Specifications or Interpretations of the Technical Bulletins."

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Milwaukee Company Adds Several New Lines

The Sterling Wheelbarrow Co., West Allis, Milwaukee, is placing in production a number of new products to round out its line of steel wheelbarrows and foundry flasks. The flask line has been extended to include the larger sizes, practically doubling this division of the business. Core flakes and bottom boards are now being manufactured to complete its foundry line. Another new line is a patented device called a runway support, the purpose of which is to hold planks for wheelbarrow runways which hook over the form in which concrete is poured. A wheelbarrow spraying outfit, incorporating a pump and tank, for spraying trees and shrubbery or for whitewashing houses and fences, is also being placed on the market.

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Manganese Steel Company in Canada

The American Manganese Steel Co., Chicago, has purchased a metal-working plant at Welland, Ont., and will organize a separate subsidiary company to operate the property as soon as necessary rebuilding and reequipping have been completed. The exact scope of the operations has not been definitely determined.

OBITUARY

DR. HARRY PHILLIPS DAVIS, vice-president and director of the Westinghouse Electric & Mfg. Co. and chairman of the National Broadcasting Co., one of the country's foremost engineers and executives, died at his home in Pittsburgh, Sept. 10. He had been ill for several months following an operation. His career was one of wide achievement. Nearly 80 patents were issued to him for his developments in electrical apparatus. Under his engineering leadership many of the most important advances of the electrical art were made, these relating to meters, measuring instruments, circuit breakers, railway control apparatus, transmission equipment and radio. For more than 21 of the 40 years during which he was connected with the Westinghouse company, Dr. Davis was in charge of his company's engineering department and for 15 years he directed both its engineering and manufacturing operations. Among his early achievements was his work in the electrification of the New York, New Haven & Hartford Railroad, the world's first single-phase railway electrification. He was a dominating factor in all phases of this electrification as well as others that followed. During the World War he took complete charge of all the company's Government contracts for munitions. It is for his development of radio broadcasting, however, that the public knew him best. He was active in every phase of radio, and at the time of his death was internationally known as the "Father of Radio Broadcasting."

Born in Somersworth, N. H., in 1868, Dr. Davis was graduated from the Worcester Polytechnic Institute with the degree of bachelor of science in engineering. After a tour of Europe he joined the detail engineering department of the Westinghouse company in 1891. Five years later he was given charge of this department and in 1904 was made manager of the company's engineering department. In 1911 he was elected a vice-president.

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HARRY M. EASTON, New York district sales manager of the Weirton Steel Co., subsidiary of the National Steel Corpn., died suddenly on Sept. 3 at New Castle, Pa. Mr. Easton was 55 years old, and had been connected with the steel industry all of his adult life. He was born in Pittsburgh and went to school there. His first work was with the Carnegie Steel Co. In 1902 he became connected with the Pope Tin Plate Co., Pittsburgh, and established a New York sales office for that company in 1909. He was in charge of this office until 1911, when he returned to the home office as general sales manager. In December, 1911, the Pope Tin Plate Co. was acquired by the Phillips Sheet & Tin Plate Co., which later became the Weirton Steel Co., and Mr. Easton remained with that company until October, 1912, when, with Charles E. Pope, he formed the Impervious Sheet Steel Co. of Pittsburgh. He resigned from that company in 1915 to reenter the employ of the Weirton Steel Co., with which he remained up to the time of his death, with the exception of a brief period during the war, when he served as assistant chief of the tin plate division, War Industries Board. While with the Weirton Steel Co. he served in various capacities. He was at one time Chicago district sales manager and later was assistant general sales manager. He had been in the New York office since 1921. He was a member of the American Iron and Steel Institute, the Duquesne Club, Pittsburgh, and other organizations.

DR. H. P. DAVIS

H. M. EASTON

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WILLIAM C. WRIGHT, for the past 21 years foundry consultant to the National Founders Association, Chicago, died at the Presbyterian Hospital in that city on Sept. 9, after an operation for appendicitis. As a young man, Mr. Wright entered the employ of the Walter A. Wood Mowing & Reaping Machine Co., where he learned the molding trade and advanced to the foremanship. He was identified for a number of years with the Draper Co. as foundry superintendent and later served in the same capacity the Rensselaer Valve Co. and the Kennedy Valve Mfg. Co.

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VAN NESS DELAMATER, identified since 1915 with the Hyatt Roller Bearing Co., Newark, N. J., disappeared with his son while on a canoe trip on Green Lake, Ont., on Aug. 29 and is believed to have lost his life in a storm. He was graduated from Cornell University in 1900.

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STEPHEN S. HALL, chairman of the board of the Pickering Governor Co., Portland, Conn., died suddenly at his summer home on Lake Pocotopaug, East Hampton, Conn., on Sept. 8. Mr. Hall was born in Portland, Jan. 18, 1864.

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TRUMAN MORSE NORTON, until two years ago secretary and treasurer of the Wallace Barnes Co., Bristol, Conn., died Sept. 9 at Hamilton, Ont. Mr. Norton was born at Guilford, Conn., 52 years ago. Two years ago he went to Hamilton in the interest of the Hamilton Machine Co., which was then being established there.

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JOHN H. HUNT, purchasing agent for the Pacific Gas & Electric Co., San Francisco, died of heart failure on Sept. 13 while swimming in the Pacific Ocean at Bolinas Beach. He was 63 years old and one of the foremost utility buyers in the West.

Unfilled Orders Drop Sharply

Unfilled orders of the United States Steel Corpn. as of Aug. 31 amounted to 3,169,457 tons. This represents a drop of 235,359 tons from the total July 31 — just about double the average decline during August for the nine years 1922 to 1930 inclusive. In that period there were three declines of more than 400,000 tons each and two small declines. There were two small increases and two others between 100,000 and 200,000 tons. Taking the nine years, the average decline was 118,000 tons. Unfilled orders at end of each month since the beginning of 1929 follows:

	1931	1930	1929
January	4,132,351	4,468,710	4,109,487
February	3,965,194	4,479,748	4,144,341
March	3,995,330	4,570,653	4,410,718
April	3,897,729	4,354,220	4,427,763
May	3,620,452	4,059,227	4,304,167
June	3,479,323	3,968,064	4,256,910
July	3,406,816	4,022,055	4,088,177
August	3,169,457	3,580,204	3,658,211
September	.....	3,424,338	3,902,581
October	.....	3,481,763	4,086,562
November	.....	3,639,636	4,125,345
December	.....	3,943,596	4,417,193

Steel Industry Is About Dragging Bottom

BY DR. LEWIS H. HANEY
DIRECTOR, NEW YORK UNIVERSITY BUREAU OF BUSINESS RESEARCH

ALTHOUGH one can hardly find a favorable feature in the iron and steel statistics for August, unless it be the establishment of a better balance between pig iron and steel ingot outputs, the writer feels that the final readjustment is nearing. Such a readjustment would bring the bottom before long.

After all, what we want to see is the bottom. It should now be clear that the effort to see an upturn, before the bottom has been touched, has been vain. A completion of the necessary readjustments and a reestablishment of equilibrium must occur before sustained recovery. When we cease trying to stimulate recovery before getting down to bed rock, the recovery will take care of itself.

Now that England has taken drastic steps to balance her budget by cutting doles and raising taxes, we at once feel that—barring a political reversal—she has hit bottom. Renewed confidence is the result. So, now that Steel Corporation leaders are reported to be about to consider wages, the hope arises that the feet of the industry are at last touching ground. Perhaps the absence of any seasonal gains thus far has been a blessing in disguise, removing the temptation to build unfounded hopes.

Certainly no gains appeared in the August figures. The average daily ingot production was off sharply, when the normal seasonal variation is upward. It fell to a rate only 43.3 per cent of estimated normal, against 48.3 per cent in July, and 80.2 per cent a year ago. This is the lowest since August, 1921, and compares with 33.1 per cent at the bottom in July, 1921.

Unfilled orders of the Steel Corporation declined also, the adjusted index falling to 76 per cent of the average for 1923-1927, against 82.5 per cent in July, and 85.9 per cent a year ago. In view of the very low level of production and shipments, this decline indicates that little new business developed.

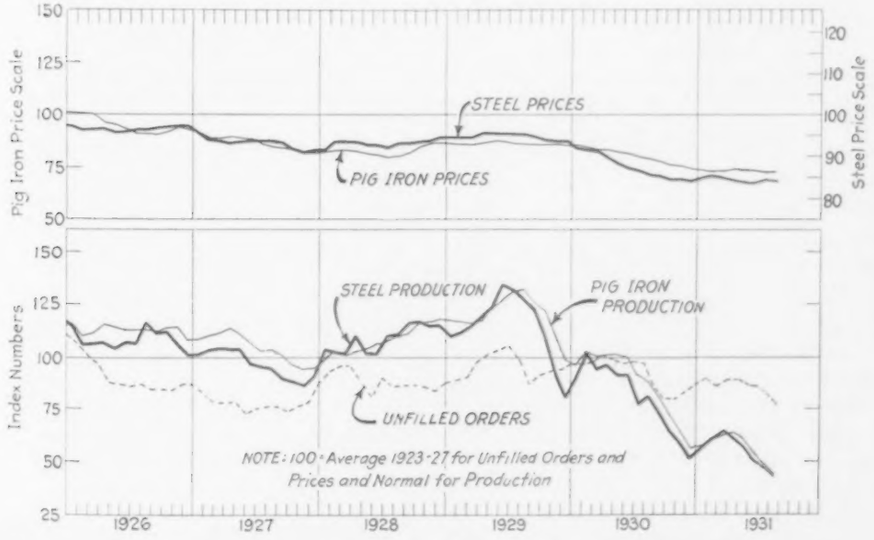
Reduced demand is confirmed by prices. Despite the decline in production, the August average price of finished steel, at 2.116c. was a little under July and only 83.8 per cent of the average during 1923-1927. It compares with 2.007c. in February, 1922, which was the low point for the 1921 recession.

Conditions similar to the foregoing can be found at about this time in 1929 and 1930, followed by further declines in the adjusted indexes of production and by gently sagging prices. That the rate of change in unfilled orders has now been rather sharply downward for two successive months furnishes considerable precedent for expecting further recession in the prices of steel stocks.

Pig iron production fell sharply, also, the adjusted index becoming 44.2 per cent of normal, against 50.1 per cent in July and 87.7 per cent a year ago. This is the lowest since October, 1921, the 1921 bottom of 31.4 per cent coming in July.

Insofar as demand comes through steel, it may be said that pig iron production is still somewhat above indicated requirements. The ratio between the adjusted indexes of production for pig iron and steel shows the former to have been 102.1 per cent in August. This, however, shows considerable improvement and compares with 109.4 per cent a year ago. Pig iron production is now closer to its average relation to steel production than it has been during any period of decline in this great recession.

The action of the pig iron market, however, can hardly be considered encouraging. Despite the fact that the August average of $15.51 was only 72.5 per cent of the 1923-1927 level (against 83.8 per cent for finished steel), the sagging trend has continued into September.



BOTH pig iron production and steel output declined more than seasonally in August. Unfilled orders of the Steel Corporation receded, also. However, the drop in unfilled tonnage (seasonally adjusted) was less abrupt than the falling off in steel production.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

(ESTABLISHED 1855)

The Depression Cult and Opportunism

THE pendulum has swung from the "new era" mania of two years ago to the depression cult of today. Just as the enthusiastic speculator of the Wall Street boom refused to listen to any suggestion that was out of tune with his optimism, the lugubrious analyst of current gloom will give no heed to opinions at variance with his pessimism. He sneers at Pollyannaism, pointing out that depression is worldwide and that the futility of propaganda remedies was demonstrated more than a year ago. He either contends that radical changes must be made in our capitalistic system or takes the diametrically opposite view that nothing can be done to alter the course of the economic cycle and that business must be allowed to get still worse before it can get any better. He is either espousing some "plan" or is arguing that no plan is the best plan.

There is undoubtedly merit in certain criticisms of our capitalistic set-up, but they can be best considered when an atmosphere favoring calm deliberation has replaced an atmosphere surcharged with emotionalism. Likewise there may be much to commend the viewpoint that business should be allowed to function with a minimum of artificial restraints. But time, and time alone, will disclose the truth, for the American public is no longer disposed to accept any so-called "expert" analysis without question.

It is undoubtedly a fact that the American people are bewildered. They know that Russia has a five-year plan and they are also aware that the standard of living among Soviet workers is very low. They have learned that unemployment insurance is not a cure for depression. They have seen the failure of the Farm Board, the soldiers' bonus and the war debt moratorium to stem the tide. They recognize the fact that the highly touted elasticity of our Federal Reserve banking system is failing to measure up to expectations. They have been disillusioned so many times that they have suspended judgment on all alleged "constructive" proposals and have swung rather generally to a policy of opportunism.

And it may be fortunate that they have adopted this attitude. At a time of emergency, when the demands of the moment must be satisfied so far as existing circumstances will permit, neither the dogmas of the planners nor the doctrine of the deflationists is of more than academic interest. Planning requires time. Deflation, if really still incomplete, requires time. But meanwhile it is both a private and public obligation to provide for those in dire need. In bending their energies to discharge this duty it is conceivable that the American people may develop a dynamic spirit that will raise business from the depths of despond to a position of renewed hope and courage. In taxing their ingenuity and initiative, whether in small ways or large, to help one another through the fall and winter months, our population will get back into habits of enterprise and will set in motion activities which may gather cumulative force.

Determination to meet the accumulating demands for relief is an eminently practical and humane policy, even though purely opportunistic. Just as the first faltering steps of the convalescent build up his confidence and strength, the remobilizing of forces to combat distress may give business more than a temporary impetus. The argument that this cannot happen without the completion of deflation or the restoration of economic balance falls on deaf ears, since the average man recalls that deflation was by no means completed in the 1921-1922 depression and is likewise aware that perfect business equilibrium is never attained. Moreover, he recognizes that maladjustments can as logically be narrowed by a leveling up from the bottom as by further declines from the top. It is no exaggeration to say that he has grown tired of repeated admonitions that "further deflation is just around the corner." He knows that neither optimists nor pessimists can penetrate the veil separating the present from the future. And he is aware that nothing recovers like recovery, once it sets in.

United in War on Unemployment

REMEMBERING with what bitterness drought relief and unemployment were discussed in the last Congress, we can think it only fortunate that nearly three months must pass before the floodgates are again released at Washington. Meanwhile the desire to help in one of the most serious crises the country has known can go on expressing itself in the free way that has been so admirable, as one and another citizen of the first line has responded to President Hoover's call.

There will be much in the countrywide movement of these coming months to remind us of the readiness with which so many leaders in business dropped personal concerns and sprang to the help of the nation when it went to war fourteen years ago. It meant everything then, and in the same way it will turn the scale now, to have men put aside political and other cleavages and cooperate heartily in meeting every demand of the situation.

For a time there was fear that Governor Roosevelt's proposal for a $20,000,000 unemployment fund in New York State would suffer in the competition of

party men for the credit of administering it. But very promptly came expressions of the public's opinion of legislators who would mix politics with relief; and the promised outcome at Albany may well be taken to represent the spirit that will prevail throughout the country. The American people will be put to a severe test by the task that is before them, but there is evidence, in the steps already taken under national, State and local organization, and especially in the marshaling of agencies of community relief, that the emergency will be fully met.

Along with the suppression of politics there should be the utmost resistance to demoralizing proposals, designed to scatter hatred and eventually to overturn the present industrial system. That industry will take on new responsibilities is coming to be generally accepted. But that will mean a wider participation in the resulting burdens, as it should mean also widely accruing benefits. The working out of so great a problem will take time and will call for patience and tolerance. When the pressing need is that all Americans be enlisted in a war on unemployment and its train of human distresses it is no time for stirring up bitterness and arraying one part of the people against another. There must be the same dropping of differences and the same earnest pulling together that showed the national character at its best in the last two years of the World War.

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Employers' Liability Made Safer

WHEN the workmen's compensation laws were enacted, the legislatures of most of the States, in order to induce, or perhaps to compel employers to accept them, so amended the employers' liability acts as to place the financial responsibility for accident flatly on the employer. Under the very unsafe conditions of employment which existed at that time in the great majority of manufacturing establishments, and in the belief in a just administration of the new form of compensation, most companies adopted it.

Previously, employers' liability gave the employer three strong defences against the injured worker's claim for damages—contributory negligence, negligence of a fellow worker, and assumption of risk. A man could not recover if he was in part to blame for the accident, or if it resulted from the carelessness of a fellow worker, or because of the dangerous hazard of his occupation, provided he had accepted such hazard. The amended laws abolished all these. Negligence no longer constitutes a defense. If an accident victim owes his plight wholly to his own negligence, he cannot recover damages. Otherwise he can. Moreover, the law, unlike workmen's compensation, does not limit the amount he may recover. That is left for a jury to decide, and, as every one knows, juries sometimes figure high in this class of tort cases. At first thought it may seem strange that important manufacturers are reverting to employers' liability as fairer to them than compensation, as it is now administered.

If conditions in industrial plants were the same today as they were 15 years ago when compensation was in the process of establishment, the new employers' acts would be prohibitively expensive. But these conditions have changed, thanks to the influences of compensation in making safety one of the most important factors in plant management. Under a system where the owner, or the insurance company to which he pays premiums, must pay damages for all accidents, regardless of who or what was responsible, there was a mighty incentive to make shops and mills and factories safe to the limit of human ingenuity. This was not the only incentive, of course; the safety movement, based upon humanitarian motives alone, was well under way. But compensation gave vigorous impetus to the great task of removing accident hazard from industry.

Therefore, because working conditions are made relatively safe, the number of accidents due to negligence other than that of the victims themselves are small, as statistics prove. The bugaboo of the amended employers' liability acts is not so terrifying after all. Most accidents result from personal carelessness, such as falling off a perfectly good ladder or dropping a casting on a foot or tumbling down a properly guarded flight of stairs. No negligence, as the law has it, can be found in such cases.

The pity of it is that workmen's compensation has been permitted to defeat its own ends. As the employer feels about it, legislatures and compensation boards have run it ragged, so to speak. Sooner or later a reaction should set in to put it on a sound, just basis again, ridding it of excessive sentimentality of administration and the influence of politics and the tendency to use it as health and unemployment insurance.

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Bewilderment

WHY is it unwise to obtain cheap woodpulp, cheap manganese ore, and even cheap wheat from Russia if the Soviet is willing so to sell them in order to buy cotton, wool, and machinery in return? Why is the effort of pauperized Russia to obtain sufficient food and some comfort for its people a menace to the rest of the world? What is the difference between communized labor and slave labor, and has slave labor ever been so efficient as free labor?

What is the popular and emotional idea of the evils of mass-production and just what is meant by that expression? Is it the manufacture of articles in quantity, e.g., automobiles, or the mining of low-grade ore in great mass, e.g., copper? In the absence of such methods should we have been able to enjoy automotive transportation or general electrification? Should we have been able to build the Panama Canal without steam shovels and other engineering contrivances? Did such "mass-production" diminish human work or increase it? Or human enjoyment?

Is the recurrence of one more period of depression in the cyclic occurrences of centuries a convincing proof of the breakdown of capitalistic, or individualistic, economy? Is the communistic economy yet of proved superiority, with the Russian experiment as the only guidance?

To what extent is labor idle through being choosy?

Should a woman who has been a weaver in a mill insist upon such employment and refuse domestic service? Does a chauffeur have always to be a chauffeur?

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▲▲▲ CORRESPONDENCE ▲▲▲

For a Sales Tax Only

To the Editor: After reading your article on "Remedies That Will Not Cure," I will not venture further than to ask you to consider the following and form your own conclusions:

Remove all taxation on real estate, income, capital or capital gains, to permit absolute freedom from the penalty of taxation regardless of how we choose to spend our money.

Collect all taxation as a percentage of the value passing between producer and consumer. This is the only source of the tax dollar now, and inasmuch as the money if collected directly from this fund is returned, it seems that it makes little difference as to the amount.

Being a rotary fund which represents both expenditures and income, the rich and the poor will benefit from the permanent improvements derived from its rotation.

This is not suggested as a cure for overproduction, but only as an encouragement for maximum consumption, by removal of the obstructions we have artificially created in our endeavor to compel others to perform the impossible feat of paying our taxes.

S. C. BOND
Modern-Bond Corpn.

Wilmington, Del.

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Steel Makers Should Buy Directly from Automobile Scrap Yards

To the Editor: Maintaining one of the largest dismantling automobile plants in the world, we are in a position to analyze at least one of the underlying reasons for the present economic situation and to formulate a plan which we believe will improve it.

The automobile business pulled us out of the depression in 1921, and with a little cooperation from the steel industry it can go a long way toward accomplishing the same results now.

Of about twenty-five million motor vehicles in this country, one-sixth, or over four million, are unfit to be operated on the highways. The complete removal of these millions through plants similar to ours in the larger cities of the country will open up immediately a tremendous market for new cars. This can be done by steel manufacturers buying scrap automobile steel, thereby enabling plants like ours to pay a fair price for these old cars. In doing this, it is natural that a demand for new steel for new cars will be created, benefiting the steel manufacturers directly.

We have been highly successful in our business, and the proposed plan is based on actual facts and experience. Operating at only one-fourth of capacity, we have completely dismantled thousands of cars in the last twelve months. Heretofore, we have been selling the steel to jobbers and brokers, but on account of their other sources of supply and a tremendous volume on hand they have practically discontinued buying automobile scrap steel. Now then, should the larger steel mills purchase automobile scrap steel direct from the automobile dismantling yards it would enable us to buy and dismantle practically all the old and defective cars in this country.

We are acquainted with your eagerness to improve the present situation and are, therefore, soliciting your cooperation in making the steel companies see the advantage of buying automobile steel instead of other scrap steel.

WYN KESSELMAN.
President, Wyn's Auto Wrecking Corpn., Ltd.

Los Angeles.

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Conditions in Iron Ore Fields

To the Editor: Taxes paid on iron ore produced in Minnesota in 1930 amounted to 59.6c. a ton of ore shipped. This was on a production of 34,881,000 tons. Taxes paid on ore in other Lake Superior States for the same year were 31.5c.; this on a production of 12,507,000 tons. It is fairly safe to predict that tax charges on ore produced in Minnesota this current year will not be much under $1 a ton. In Michigan and Wisconsin, owing to a different method of tax valuation, the increase will be by no means so high. Taxes there for the year may amount to 40c. a ton, perhaps.

Only once in the history of Lake iron mining have taxes been as great a burden as now. That was in 1921, when total shipments from the region showed an even more drastic drop than they are likely to this season. In 1921 Minnesota's ore taxes were $1.15 a ton; Michigan's were 82c.

Efforts are being made to ease this burden for next year. How successful they will be is a question. By far the greater share of tax money is spent for local municipal purposes,—villages, towns, cities on the Mesabi range in particular. These have built up such extravagant overheads and are laboring under such volumes of unfunded obligations that, if they would, they cannot reduce their budgets materially and remain solvent. And it is difficult for them to fund at low interest rates present short-time obligations. A definite effort toward a 15 per cent reduction will be made, but it is a question if it will receive sufficiently unanimous official support.

In some parts of the Lake region mines are operating 4 to 6 days a month, elsewhere three shifts a week, elsewhere half time, and many are closed. To the best of their ability employers are dividing what work there is among all their men. But the winter will bring many serious and dangerous problems.

Iron county, Michigan, contemplated a bond issue to relieve unemployment, but an arrangement has been made by mine operators to obviate that by reopening idle mines and producing for stock. Some 80 per cent of this county's valuation is in mines, and it seemed best to handle the situation in this way. Other parts of the region are considering similar plans; indeed it has been adopted unofficially in several places.

Generally speaking, actual reduction of the pay rate per hour has not taken place in mine labor payrolls, but most mining company offices throughout the districts have cut salaries about 10 per cent and have given the usual summer vacations, but this time without pay, thus temporarily reducing salaries about 17.5 per cent. Age retirement rules are being adhered to more closely than in the past. In fact, there has been rigid retrenchment all along the line, except in the matter of public expenditures, for which taxes provide the money. And some economy has been effected even there, but not enough.

DWIGHT E. WOODBRIDGE
Consulting engineer.

Duluth

Rail Inquiries and Pipe Line Awards Are Market Features

THREE Railroads Come Into Market for 111,000 Tons of Rails—Line Pipe Awards Total 54,000 Tons—Structural Outlook Promising

INQUIRIES for 111,000 tons of rails, awards of 54,000 tons of line pipe, increasing activity in structural steel and concrete bars, and growing interest among automobile makers in their forward requirements are promising developments in the iron and steel market.

The Chesapeake & Ohio is in the market for 55,000 tons of rails, the Chicago & North Western for 30,000 tons and the Erie for 26,000 tons. These inquiries, following closely those issued by the Delaware & Hudson and the Boston & Maine, indicate that the annual rail buying movement will soon get under way. While the total purchases of the carriers are likely to be the smallest of recent years, considerable holdover tonnage from 1930 is still on mill books awaiting release. Railroad equipment buying continues at a low ebb, but a purchase of 2000 cars by a Western line is reported to be in prospect.

LINE pipe orders include 33,000 tons, distributed among four makers by the Stanolind Pipe Line Co., 11,000 tons bought by the Standard Oil Co. of New York for a line from Providence, R. I., to Worcester, Mass., and 10,000 tons ordered by the Lycoming Natural Gas Co. for a project in the State of New York.

The outlook in fabricated steel construction is good for the remainder of the year, in view of the large amount of public work that is coming to a head, and prospects for a revival of private building in 1932 are stated to be more definitely promising. Conspicuous among the larger pending projects is a bridge at New Orleans, requiring 60,000 tons of structural steel, on which bids have just been taken. Fabricated steel awards of the week total 30,000 tons, compared with 41,000 tons in the previous week. New work to come into the market calls for 27,000 tons as against 37,000 tons the week before.

Reinforcing steel lettings, at 6000 tons, are the largest in nine weeks. New inquiries, at 9000 tons, were swelled by 5500 tons required for a water freight terminal in New York.

Two vessels placed with the Sun Shipbuilding & Drydock Co. by Seatrain, Inc., will take 11,000 tons of plates.

AUTOMOBILE companies and parts makers are sounding out the steel market on their future needs, particularly in steel bars. Several inquiries are for the last quarter, while others call for delivery through the first and second quarters of next year. The motor car industry is evidently making a test to determine whether attractive tonnages for extended shipment will develop price concessions. Its move is also interpreted as tying in with preparations for the bringing out of new models. Inquiries received by stamping plants for prices on parts for new cars indicate that changes in mechanical features and body design are unusually numerous.

Pending the launching of production on the new models late in the year, no upturn in automobile manufacture is now expected. September output may not equal that of August, and the October performance will probably be the poorest of the year. But automobile steel specifications are likely to show considerable improvement by the middle of next month.

Steel ingot production is unchanged at 30 per cent of capacity, but an increase is looked for in the coming week.

PRICES show no significant change. Scrap markets are lethargic and are not free from weak spots, but in Pittsburgh the price situation remains firm. Interest in pig iron is confined mainly to small tonnages for quick shipment. In finished steel fourth quarter contracting has not yet got under way and mills are not pushing consumers to cover their needs. Makers of alloy steel bars have followed producers of wire products, sheets and strips in reaffirming present quotations for the coming quarter. An announcement on tin plate prices may be made about Oct. 1. Meanwhile tin plate output, now at 45 per cent of capacity, appears to be headed for further contraction before mills begin to roll tonnage in advance of anticipated releases.

THE IRON AGE composite prices are unchanged, finished steel at 2.116c. a lb. for the ninth week, pig iron at $15.42 a ton for the second week and steel scrap at $9.17 a ton, also for the second week.

PITTSBURGH Steel Operations Gain Slightly—Mills Now Look to Fourth Quarter for Betterment

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Steel ingot production has regained losses of Labor Day week.

* * *

Belief grows that fourth quarter will bring limited improvement.

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Line pipe orders of 32,000 tons distributed among four producers.

* * *

Despite lack of scrap buying, market undertone is firm, chiefly because of scarcity of good grades.

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PITTSBURGH, Sept. 15.—The passing of the first half of September without noticeable change in demand for steel products has had a depressing effect upon sentiment in the trade. Yet there is still a belief that the fourth quarter may bring a limited improvement of a seasonal character.

The performance of the automobile industry has been particularly discouraging. Steel producers now feel that this important outlet will not show much life until well into October, when production of new models gets under way in earnest. If there has been no change in the other significant consuming industries, it may be said just as truthfully that no important gains were expected. It is too early to expect purchases of consequence by the railroads, though some rail inquiries are out, and the oil and gas industry is too much concerned with its own problems to offer much help to others. Construction activity is naturally less pronounced in the autumn, and structural and reinforcing bar awards are lighter even though a large volume of pending business is still before the trade.

The placing of an order for 32,000 tons of line pipe by a Standard Oil Co. subsidiary has been the outstanding transaction of the week. The material will be rolled immediately for shipment before cold weather sets in. It is also reported that urgency for delivery was a factor in obtaining a very satisfactory price for the material following a very weak market in line pipe during the greater part of the year.

Aside from this business, new buying of steel has been of little importance, and has been featured only by a few purchases of sheets, strip steel and bars by certain automobile companies. Fourth quarter contracting on the part of smaller consumers has not got under way, but mills are not pushing customers to cover their needs, and, as a result, the price structure has been fairly sound in a buyers' market. Sheet quotations have held remarkably well on the schedules adopted July 1, and heavy hot-rolled products seem to be commanding 1.60c., Pittsburgh, on the ordinary run of business.

The steel ingot operating rate in this district has regained most of the loss sustained during the Labor Day week, and again ranges from 28 to 30 per cent of capacity. One of the smaller independent plants has resumed production in three open-hearth furnaces recently idle, and the larger interests have succeeded in steadying their production. A steel works blast furnace in the Pittsburgh district has been banked, but another has resumed operations in western Pennsylvania. This leaves 11 active steelmaking furnaces running in the Pittsburgh district, although another is scheduled to go into blast during the week. Operations in the Wheeling area average about 40 per cent, while the Mahoning Valley is running at 30 to 35 per cent.

Finishing mill production has not changed materially, although pipe output will be stepped up immediately as a result of the large order placed last week. Sheet production ranges from 30 to 35 per cent, and tin mills are doing about 45 per cent.

The market on raw materials has no feature except continued strength in scrap quotations. Pig iron and coke are very dull.

SEMI-FINISHED STEEL

No fourth quarter inquiry has appeared, as operations of non-integrated makers of sheets and strip steel continue at low rates. Mills still quote $29, Pittsburgh, on billets, slabs and sheet bars, and $35 on forging billets. Little improvement in demand for wire rods has developed. Producers are willing to take fourth quarter contracts on the basis which has prevailed for the last three months, namely, $35, Pittsburgh or Cleveland.

PIG IRON

Shipments this month are about the same as they were during August, and inquiry is generally lacking. Buying is confined to carload lots, and consumers are not inclined to commit themselves further. Prices are holding at the levels held for several months. A Valley merchant stack is reported to have withdrawn from the market on the basic grade following the disposal of its stock. However, a heavy tonnage of steel company basic iron still overhangs the market.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$15.50 to $16.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$16.00 to $16.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

RAILS AND TRACK SUPPLIES

Quarterly buying of accessories promises to be very light. Rail releases are lower, many of the carriers having fully specified their old contracts. Prices are apparently well maintained.

BOLTS, NUTS AND RIVETS

While moderate buying by automobile makers has given this market a little life, releases show no gains and current small orders are only sufficient to support an operation of 20 to 25 per cent of the industry's capacity. Prices on bolts and nuts are fairly well maintained at 73 and 10 per cent off list, and makers are willing to take fourth quarter contracts on this basis. The $5 a ton reduction on large rivets, announced last week, has been generally adopted in the industry and seems to have ended price shading. Small rivets are unchanged in price.

BARS, PLATES AND SHAPES

The market is without feature, although outstanding inquiry for structural steel and reinforcing bars is still heavy. As might be expected in this season, new business is not coming out so rapidly as it was earlier in the summer. Pittsburgh mills are interested in the placing of a bridge across the Mississippi River near New Orleans, requiring 60,000 tons of structural shapes, upon which bids were taken Sept. 15. About 1600 tons of plates and shapes will be required for caissons on this job, as well as 2500 tons of reinforcing bars in the approaches. Some of the automobile companies have placed and are placing their fourth quarter requirements for alloy steel bars, but specifications are no heavier. Demand for plates is very light, although the skelp requirements of electric weld pipe mills are holding up. The New York Central

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Sept. 15, 1931	Sept. 8, 1931	Aug. 18, 1931	Sept. 16, 1930
No. 2 fdy., Philadelphia	$16.26	$16.26	$16.76	$19.76
No. 2, Valley furnace	17.00	17.00	17.00	18.00
No. 2 Southern, Cin'ti	14.69	14.69	14.69	15.69
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.50	17.50	17.50	17.50
Basic, del'd eastern Pa.	16.75	16.75	16.75	18.75
Basic, Valley furnace	15.50	15.50	15.50	18.00
Valley Bessemer, del'd P'gh.	18.76	18.76	18.76	20.26
Malleable, Chicago*	17.50	17.50	17.50	17.50
Malleable, Valley	17.00	17.00	17.00	18.50
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seab'd carlots †	$85.00	$85.00	$85.00	94.00

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Ferromanganese quotations adjusted to carload unit; larger quantities at discounts.

Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh	29.00	29.00	29.00	31.00
Slabs, Pittsburgh	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.70

Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.93	1.93	1.93	1.95
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.88	1.88	1.88	1.88
Structural shapes, P'gh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.85½	1.85½	1.85½	[illegible]
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.55	1.55	1.55	1.65
Cold-rolled strips, Pittsburgh	2.15	2.15	2.15	2.35

Finished Steel, *Per Lb. to Large Buyers:*	Sept. 15, 1931 Cents	Sept. 8, 1931 Cents	Aug. 18, 1931 Cents	Sept. 16, 1930 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	2.90	2.90	2.90	3.00
Sheets, galv., No. 24, Chicago dist. mill	3.00	3.00	3.00	3.10
Hot-rolled sheets, No. 10, P'gh	1.70	1.70	1.70	...
Hot-rolled sheets, No. 10, Chicago dist. mill	1.80	1.80	1.80	...
Wire nails, Pittsburgh	1.90	1.90	1.90	2.00
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.10
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., P'gh	2.55	2.55	2.55	2.70
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.85
Tin plate, 100 lb. box, P'gh	$5.00	$5.00	$5.00	$5.25

Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$10.75	$10.75	$10.75	$15.75
Heavy melting steel, Phila	8.50	8.50	8.75	13.00
Heavy melting steel, Ch'go	8.25	8.25	8.25	12.50
Carwheels, Chicago	9.50	9.50	9.50	13.50
Carwheels, Philadelphia	12.00	12.00	12.00	15.00
No. 1 cast, Pittsburgh	*10.50*	11.00	11.00	13.50
No. 1 cast, Philadelphia	11.50	11.50	11.50	13.00
No. 1 cast, Ch'go (net ton)	8.50	8.50	9.00	11.50
No. 1 RR. wrot., Phila	10.00	10.00	10.00	15.00
No. 1 RR. wrot., Ch'go (net)	7.00	7.00	7.00	10.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.40	$2.40	$2.40	$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	7.62½	7.87½	7.87½	10.87½
Electrolytic copper, refinery	7.00	7.25	7.25	10.25
Tin (Straits), New York	25.45	25.62½	25.70	29.87½
Zinc, East St. Louis	3.75	3.80	3.80	4.25
Zinc, New York	*4.10*	4.15	4.15	4.60
Lead, St. Louis	4.22½	4.22½	4.22½	5.35
Lead, New York	4.40	4.40	4.40	5.50
Antimony (Asiatic), N. Y.	6.60	6.60	6.60	7.75

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Railroad is placing orders this week for 2300 tons of miscellaneous steel for car building. A few scattered orders for barges and pontoons are reported. Prices are holding at 1.60c., Pittsburgh, and there is no intimation of a change on fourth quarter business.

COLD-FINISHED STEEL BARS

Releases are no heavier than they were in August, which was one of the worst months in the history of the industry. No formal action has been taken on fourth quarter business, although mills are willing to quote the present price of 2.10c., Pittsburgh, if customers wish to renew their contracts.

TUBULAR GOODS

The Stanolind Pipe Line Co., Tulsa, Okla., has closed against its inquiry for 10¾ and 12¾-in. line pipe, to be used as "loops" on its line in the mid-continent fields. Approximately 32,000 tons of steel will be required for the pipe, which will be turned out by four producers. No action was taken on the 8⅝-in. pipe included in the original inquiry. Both seamless and electric weld material will be used, and both Pittsburgh and Valley mills will be benefited by the orders. Shipments will be begun immediately, as the company expects to build the line this year. This is the last of the large inquiries for line pipe which have been before the trade in recent weeks, and it is believed that the season is now too far advanced for much additional business of this type. Proration activity in the east Texas and Oklahoma fields has had little effect on demand for oil well casing and other oil well supplies. Standard pipe is still very quiet, although possibly moving at a slightly better rate than prevailed during the summer. Mechanical tubing is very dull.

WIRE PRODUCTS

New business this month is running ahead of that of August, but specifications have not gained very much. Jobbers are buying only for their immediate needs, and, in the agricultural districts very little stocking, which might be expected at this time of the year, is reported. Producers are taking fourth quarter contracts at the prevailing quotations of 2.20c., Pittsburgh, on manufacturers' wire, and $1.90 a keg on nails.

SHEETS

Despite a limited enlargement in the requirements of the automobile industry, demand for sheets this month has not changed materially from that of August. Automobile tonnage is spotty, but some quarterly buying is reported. There is little to indicate that production of automobiles will rise very much in October, as the larger interests do not seem anxious to place their new models on the market before the end of the year. Miscellaneous demand for sheet steel from other consuming groups is still limited. Radio makers are running at a fair rate, but far under the averages of a year ago. Many small manufacturers in widely diversified lines who use sheet steel are not operating at all. Prices are well maintained on spot tonnage, and producers are succeeding in taking some contract business at the full prices.

THE IRON AGE COMPOSITE PRICES

	Finished Steel	Pig Iron	Steel Scrap
Sept. 15, 1931	2.116c. a Lb.	$15.42 a Gross Ton	$9.17 a Gross Ton
One week ago	2.116c.	15.42	9.17
One month ago	2.116c.	15.50	9.25
One year ago	2.142c.	16.88	13.75
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1931	2.142c., Jan. 13	2.102c., June 2	$15.90, Jan. 6	$15.42, Sept. 8	$11.33, Jan. 6	$9.08, June 23
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

TIN PLATE

Demand shows little change. Operations average about 45 per cent of capacity. Some further decline may be expected before mills begin to roll tonnage in advance for anticipated releases.

STRIP STEEL

The automobile industry has done some fourth quarter buying, but there is no improvement in general demand. Releases thus far in the month are about the same as they were in the first half of August. The price situation seems satisfactory, with hot-rolled strip holding at 1.55c. and 1.65c., Pittsburgh, and cold-rolled at 2.15c. to 2.25c.

COAL AND COKE

No change is reported in this market, although demand for heating coke is beginning to show the usual seasonal upturn. Furnace coke is very dull, with practically no buying reported. The foundry grade is quiet, but shipments are holding at about the same rate which has prevailed for the last two months.

OLD MATERIAL

Although no new scrap purchases are reported, the market has retained its recent strength, and heavy melting steel is still quotable at $10.50 to $11, with railroad steel difficult to buy at even higher prices. Scrap is becoming increasingly hard to buy because of light production by railroads and industrial plants, and it seems likely that the present levels may easily be held in spite of the failure of open-hearth consumption to improve much. Machine shop turnings are stronger, following a sale at $8, but the blast furnace grades are weaker in the absence of a market. Specialties also lack strength.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$10.50 to $11.00
No. 2 heavy melting steel	9.75 to 10.25
Scrap rails	10.75 to 11.25
Compressed sheet steel	10.50 to 11.00
Bundled sheets, sides and ends	9.50 to 10.00
Cast iron carwheels	10.50 to 11.00
Sheet bar crops, ordinary	11.00 to 11.50
Heavy breakable cast	8.00 to 8.50
No. 2 railroad wrought	10.50 to 11.00
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	7.50 to 8.00
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	12.50 to 13.00
Railr. coil and leaf springs	12.50 to 13.00
Rolled steel wheels	12.50 to 13.00
Low phos. billet and bloom ends	14.50 to 15.00
Low phos. mill plates	12.50 to 13.00
Low phos. light grades	12.50 to 13.00
Low phos. sheet bar crops	13.50 to 14.00
Heavy steel axle turnings	9.50 to 10.00
Electric Furnace Grades:	
Low phos. punchings	13.50 to 14.00
Heavy steel axle turnings	9.50 to 10.00
Blast Furnace Grades:	
Short shoveling steel turnings	7.00 to 7.50
Short mixed borings and turnings	7.00 to 7.50
Cast iron borings	7.00 to 7.50
Rolling Mill Grades:	
Steel car axles	16.50 to 17.50
Cupola Grades:	
No. 1 cast	10.00 to 11.00
Rails 3 ft. and under	12.50 to 13.00

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.10c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.05c.
Galv. sheets (No. 24), 25 or more bundles	3.40c.
Hot-rolled sheets (No. 10)	3.15c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count,	70 and 10 per cent off list
Machine bolts, 100 count,	70 and 10 per cent off list
Carriage bolts, 100 count,	70 and 10 per cent off list
Nuts, all styles, 100 count,	70 and 10 per cent off list
Large rivets, base per 100 lb	$3.20
Wire black, soft ann'l'd, base per 100 lb.	2.30
Wire, galv. soft, base per 100 lb	2.75
Common wire nails, per keg	2.05
Cement coated nails, per keg	2.05

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

Low Point Passed, Belief of Construction Institute

Faith in the future of the steel construction industry is stressed by the American Institute of Steel Construction in a special message to steel constructors. Evidence of this faith is borne out by the increased contributions in 1931 toward cooperative work carried on by the institute. The United States Steel Corpn. and the Bethlehem Steel Corpn. doubled their contributions from $25,000 to $50,000, Jones & Laughlin Steel Corpn. doubled its donation from $5,000 to $10,000 and H. H. Robertson & Co. increased their contribution from $2,500 to $3,000.

"It is the opinion of our experts," the message states in part, "that the steel industry has passed its low point."

In discussing future requirements of steel, it is pointed out that up to Aug. 6 the value of public and semi-public buildings being planned exceeded six billions of dollars, while the amount of contracts already placed since December, 1930, now totals more than two billions of dollars. Large quantities of steel will be required to complete these contracts, as well as for additional contracts being awarded at the rate of $40,000,000 each month.

Research and development work has proved that potential markets can be found for armorsteel roadguard, battledeck steel floors in buildings, bridges and residences; steel in residences, H-columns for piling, portable steel parking platforms for vacant lots, steel dams, curbing, swimming pools, roofs, railroad crossings and highways.

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Tidewater Structural Materials Corpn. has opened a new warehouse at 1001 Sawmill River Road, Yonkers, N. Y., to which the executive and sales offices of the company have been removed from 79 Madison Avenue, New York.

CHICAGO

Steel Market Showing Little Change and the Outlook Remains Uncertain

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Ingot production has not shown expected rebound from low of holiday week; now at 29 per cent in district.

* * *

Specifications and new business show no perceptible change for the better.

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Rail production has failed to expand this month, and new buying may develop slowly.

* * *

Structural steel awards the most impressive feature of current requirements.

* * *

Pig iron shipments running ahead of those in August, but buying is small.

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CHICAGO, Sept. 15.—Changes in the volume of specifications and new buying of finished steel products are almost imperceptible. Ingot production is not more than 29 per cent of capacity, which stresses the fact that the rebound from the holiday week has been below expectations of producers. One bar mill unit is operating intermittently and schedules at plate mills are extremely irregular. For the most part, prices are being reaffirmed for tonnages that are to be delivered in the fourth quarter, but consumers show little interest in future commitments.

Reports are again being circulated that railroad equipment is to be purchased in the West. It is unconfirmed that one railroad will be in the market for 2000 cars within the next 60 days. Activity in rails is dull, except that plans are reported to be under way by several railroads that run east from Chicago. Small as 1931 rail programs were, it seems quite evident that some tonnage will be carried over to next year. In August there was some promise that September rail production would expand; however, this has not come to pass, and the inference is that plans have been altered and that mills can look for little aid for schedules from old bookings of rails.

Awards of structural steel are rather impressive, considering that no outstanding tonnages have been placed in recent days. However, much of the tonnage placed was for Illinois bridge and overhead crossing work. Fresh inquiries for building work overshadow bridge projects, a reversal of the recent trend.

As viewed from almost every angle, the steel market in the Chicago area is showing little change from day to day and the future remains clouded.

FERROALLOYS

The ferroalloys market is dull and especially so in spiegeleisen. Shipments thus far in September are close to the average maintained in August.

PIG IRON

Shipments of Northern foundry iron are running ahead of the average in July, but other phases of this market are not keeping step with this improvement. New buying at $17.50 a ton, local furnaces, is extremely spotty and in small lots and, with few exceptions, consumers will take shipments only in small quantities. Three merchant stacks, operating below capacity, are readily supplying melters' needs in this district. Demand for charcoal iron is dull, and only a few cars of Southern iron are moving to Chicago and nearby points. Prices on Southern iron are strong at $11 a ton, Birmingham. The silvery market is without feature.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	18.00
Malleable, not over 2.25 sil.	17.50
High phosphorus	17.50
Lake Super. charcoal, sil. 1.50	$25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos. sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

STRIP STEEL

Most producers are reaffirming present quotations for tonnage that will be delivered in the fourth quarter. Quotations on hot strip are steady at 1.65c. and 1.70c. a lb., Chicago. New buying remains spotty, though there is promise of expansion due to the fact that a few fourth quarter inquiries are now before the trade. Hot strips are moving in moderate volume to automobile frame plants.

BARS

Unsteadiness in quotations on mild steel bars, a condition which has existed for some time in this market, seems to be more or less confined to prices named to fabricators of structural steel and reinforcing bars.

Quotations to the manufacturing trade remain fairly steady at 1.70c. a lb. Chicago. Recent specifications, as measured by volume, have changed little and still show the characteristic of being widely diversified as to consuming industries. Most users still hold to the practice of taking only such quantities as can be used immediately. Inquiries for fourth quarter are extremely scarce. Releases by builders of road machinery are lighter as manufacturing programs near completion. However, the delay in much of the Illinois State road program may temporarily revive this machinery line because contractors will be expected to do as much work as possible before cold weather. Demand for iron bars is very light and mills are operating intermittently. Prices for alloy steel bars have been reaffirmed for fourth quarter. Demand from manufacturers of farm implements remains light, but slightly larger shipments of alloy steel bars are moving to automobile plants and manufacturers of parts. Inquiries for rail steel, both for immediate and future delivery, are unusually light, but mill operations remain close to a 50 per cent basis.

RAILS AND TRACK SUPPLIES

A September upturn in rail production, which had been prophesied in August by local producers, has failed to materialize. Output ranges from 20 to 25 per cent of capacity. Order books are light, and even the present low rate of production cannot be maintained long after the end of September. New buying of rails in small lots is dull, and there is as yet no formal inquiry in this district for rails that are to be delivered in 1932. However, it is understood that preliminary steps to purchase are being taken by the Pennsylvania and Chesapeake & Ohio. One Western railroad, which for a long time has held up releases of track accessories, has sent through specifications which, though not large, are rather impressive in a market such as exists at this time.

CAST IRON PIPE

This market continues to give a fairly good account of itself, and the near future is not without promise. On the whole, prices are fairly well maintained on the average run of business where rail and water shipping rates do not alter the competitive set-up. A keenly contested tonnage is soon to be let at Milwaukee, where sellers have also had to take into account the local foundry situation. United States Pipe & Foundry Co. is low bidder on the 2000 tons of 24 to 54-in. Class C pipe at $36 a ton, delivered. The freight rate from Birmingham to Milwaukee is $8.40 a ton. The United States company has

also entered an alternate bid of $34 a ton if awarded the complete contract. R. D. Wood & Co. bid $35 a ton, and James B. Clow & Sons bid $39.40. Marshfield, Wis., will open bids Sept. 24 on 2100 ft. of 12-in. Class C pipe, and Ironwood, Mich., will open bids Sept. 16 on 1380 ft. of 6-in., 1800 ft. of 8-in. and 300 ft. of 10-in. Class C pipe.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $41 to $43; 4-in., $44 to $46; Class A and gas pipe, $3 extra.

SHEETS

Current prices, which are holding on small and scattered orders, have been reaffirmed for fourth quarter. Specifications are in such volume as to support output in the range from 30 to 35 per cent of capacity. Inquiries, few of which are for fourth quarter, do not promise marked improvement in the near future. Barrel and container producers continue to operate on reduced schedules, and the roofing trade has had no opportunity to take normal quantities of sheets.

Base prices per lb., deliv'd from mill in Chicago: No. 24 hot-rolled annealed, 2.55c.; No. 24 galv., 3.05c.; No. 10 hot-rolled, 1.85c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

PLATES

Of outstanding interest in this market is the announcement that the Stanolind Pipe Line Co., a subsidiary of Standard Oil Co. of Indiana, has decided to proceed with pipe line construction. Orders have been distributed among several pipe manufacturers for a total of 90 miles of 10¾-in. and 195 miles of 12¾-in. pipe, a total of about 32,000 tons of steel. The National Tube Co. and the A. O. Smith Corpn. are the two producers in this district which benefit by these orders. Though opinions of pipe sellers do not coincide, there are some who find the market somewhat more alive and who believe they can foresee more active business in the near future. Inquiries for tank plate total about 3000 tons, of which 2600 tons is for two projects in mid-continent oil fields.

STRUCTURAL MATERIAL

Recent structural awards total 9000 tons, of which 8000 tons is for Illinois State highway work and a few hundred tons for a railroad bridge. Only 850 tons is represented in new building awards. The promise is, however, that the relation between tonnages for bridges and buildings will soon be reversed, as indicated by the fact that fresh inquiries for bridges total only 1700 tons, with over 6000 tons of new building business in sight. Bids are to be opened this week in Louisiana on a bridge that will require about 60,000 tons of steel.

REINFORCING BARS

Most of the large pending projects in the district are still to be placed. New inquiry is decidedly light. Bids on the general contract for 3700 tons of bars for the Chicago Sanitary District were taken last week and this tonnage is expected to be let at any time. The same is true for the Chicago Post Office, while a considerable tonnage is involved in Illinois State highway work which will be placed in the next week or two. No change in prices is reported, although competition on some of the large projects has been very keen.

WIRE PRODUCTS

Books have been opened for fourth quarter at unchanged prices. Jobbers, under the influence of lack of cash in farmers' hands, are holding out of the market, but a few inquiries for future needs have been received from the manufacturing trade. Although sellers anticipate that shipments this fall will about equal those of a year ago, they are not expecting anything near a normal market. Production of wire and wire products remains in the range from 20 to 25 per cent of capacity.

BOLTS, NUTS AND RIVETS

Resistance to prices continues to develop, and quotations are uncertain. Spot business is dull. Sellers have about made up their minds to narrow rather sharply the circle of consumers to whom fourth quarter contracts will be offered. Production is close to 25 per cent of capacity.

COKE

Shipments of by-product foundry coke remain at the August average, and inquiries do not point to an upward swing in demand. The price is steady at $7.50 a ton, local ovens.

OLD MATERIAL

The scrap market presents about the same picture as in the last week or two. Purchases of heavy melting steel continue to dribble to brokers at prices that are unchanged. Blast furnace grades, including cast iron borings, short shoveling turnings and machine shop turnings, are off 25c. a ton, following the completion of accumulations that were made for the purpose of water shipments from Chicago to a Lake Erie port. Local mills are making very little use of blast furnace grades and their supplies are adequate for all immediate needs. Prices for rerolling rails are steady in a market which is characterized by ample stocks at mills, but a scarcity of tonnages appearing on tracks because railroad track laying operations have been light for many months and also because the railroads are less inclined to press scrap accumulations on the market. Several large lift bridge projects in Chicago are drawing heavily against available supplies of punchings, which are used for counterweights. In an effort to meet specifications, dealers are being forced to pay 50c. above the market as it stood a few days ago. There is much talk but little action in the matter of shipping heavy melting steel by boat from Chicago to Lake Erie.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.55c. to 2.00c.
Rail steel reinforcement—	
For buildings	1.25c. to 1.55c.
Highway slabs	1.50c.
For bridges and culverts	1.65c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, ⅞ in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes (⅞ in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Coach and lag screws	73
Hot-pressed nuts, sq., tap. or blank	73
Hot-pressed nuts, hex., tap. or blank	73
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

Prices del'd Chicago dist. consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$8.00 to	$8.50
Shoveling steel	8.00 to	8.50
Frogs, switches and guards, cut apart, and misc. rails	8.00 to	8.50
Factory hyd. comp. sheets	6.50 to	7.00
Drop forge flashings	6.00 to	6.50
No. 1 busheling	6.00 to	6.50
Forg'd cast and r'l'd steel carwheels	8.50 to	9.50
Railroad tires, charg. box size	10.50 to	11.00
Railroad leaf springs cut apart	10.25 to	10.75
Axle turnings	6.75 to	7.25
Acid Open-Hearth Grades:		
Steel couplers and knuckles	9.00 to	9.50
Coil springs	10.50 to	11.00
Electric Furnace Grades:		
Axle turnings	7.25 to	7.75
Low phos. punchings	11.50 to	12.00
Low phos. plates, 12 in. and under	10.00 to	10.50
Blast Furnace Grades:		
Cast iron borings	4.00 to	4.50
Short shoveling turnings	4.00 to	4.50
Machine shop turnings	4.00 to	4.50
Rolling Mill Grades:		
Rerolling rails	10.00 to	10.50
Cupola Grades:		
Steel rails, less than 3 ft.	10.25 to	10.75
Steel rails, less than 2 ft.	11.00 to	11.50
Angle bars, steel	9.25 to	9.75
Cast iron carwheels	9.50 to	10.00
Malleable Grades:		
Railroad	7.50 to	8.00
Agricultural	7.50 to	8.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	19.00 to	21.00
*Relaying rails, 65 lb. and heavier	22.00 to	27.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	8.50 to	9.00
Iron arch bars and transoms	9.00 to	9.50
Iron car axles	15.50 to	16.50
Steel car axles	12.00 to	12.50
No. 1 railroad wrought	7.00 to	7.50
No. 2 railroad wrought	7.00 to	7.50
No. 1 busheling	5.50 to	6.00
No. 2 busheling	4.00 to	4.50
Locomotive tires, smooth	11.50 to	12.50
Pipes and flues	5.50 to	6.00
Cupola Grades:		
No. 1 machinery cast	8.50 to	9.00
No. 1 railroad cast	7.00 to	7.50
No. 1 agricultural cast	7.00 to	7.50
Stove plate	6.25 to	6.75
Grate bars	5.50 to	6.00
Brake shoes	5.75 to	6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

CLEVELAND — Automobile Companies Inquire for Bars as Far Ahead as First Half of 1932

CLEVELAND, Sept. 15.—Interest in their future requirements of steel bars is being shown by some of the automobile manufacturers and parts makers. Several inquiries, some for specific tonnages and others for requirements for specified periods, came from this source during the week, some for the last quarter and others for delivery extending through the first and second quarters of next year.

The automotive industry, in the opinion of some steel producers, is sounding out the market with a view, perhaps, of developing price concessions for attractive tonnages for extended future delivery. Mills, however, show no disposition to quote prices beyond the last quarter. Several automobile makers also have sent inquiries to stamping plants for prices on parts for new models that are to come out around the first of the year. Blueprints accompanying the inquiries indicate numerous changes in body design and mechanical equipment. Automobile model changes will be more numerous than for a long time, according to some in close touch with the industry. Automobile manufacturers hope by making important improvements in mechanical features and body design to arouse the buying public and start the motor car industry back on an upward trend in 1932.

Demand for steel bars, largely from the motor car industry, gained slightly the past week, but orders for sheets, strip and other steel products showed no improvement. Operations of metal-working plants in this territory so far this month have failed to improve.

Steel plant operations in Cleveland this week lost the three-point gain made last week, declining to 29 per cent of ingot capacity.

The Van Sweringen interests have issued an inquiry for 30,000 tons of rails for the Chesapeake & Ohio Railroad for 1932. This is about one-half of the company's requirements last year, but it is stated that additional purchases may be made later. This inquiry does not include the Pere Marquette rails, which are to come out later.

Present nail and wire prices have been reestablished for the fourth quarter as well as the present $35, Cleveland, price on wire rods. Additional mills have reestablished current sheet and hot and cold-rolled strip prices for the coming quarter.

PIG IRON

The slight improvement in shipments this month, previously noted, is being maintained. A further gain that has been looked for from the motor car industry has not yet materialized. New demand continues light, and nearly all orders are for small lots for early needs. Most jobbing foundries in Ohio have only very limited amount of business and their operations show no improvement. Local furnaces have large stocks. Prices are steady at regular quotations of $16 to $17, Lake furnace, for foundry and malleable iron for Ohio and Indiana shipment, $17 to $17.50 for Michigan and $17, Cleveland, for local delivery. However, orders are not large enough to furnish much test of the market.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$17.00
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.50
Ohio silvery, 8 per cent	25.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

IRON ORE

Ore on docks Sept. 1 amounted to 5,685,751 tons, against 5,540,776 tons on the same date a year ago. Receipts at Lake Erie ports during August were 3,228,915 tons and for the season to Sept. 1, were 9,337,352 tons, against 21,683,307 tons during the corresponding period last year. Shipments from these docks last month were 2,254,135 tons and for the season until Sept. 1 were 7,578,943 tons, against 16,186,011 tons during the same period last year. Receipts at other than Lake Erie ports in August were 1,658,364 tons. These ports until Sept. 1 received 5,582,814 tons, against 9,804,423 tons in the same period last year.

BARS, PLATES AND SHAPES

Demand for steel bars gained slightly the past week, orders being more numerous but not for larger lots than recently. The building field is bringing out little new inquiry. An Ohio fabricator has taken a bridge in Louisiana requiring 4000 tons of structural shapes. Activity is light in reinforcing bars, although some good-sized local jobs are still pending. With little resistance from buyers, prices are steady at 1.65c., Cleveland, for steel bars for local delivery and outside shipment and 1.60c., Pittsburgh, for plates and shapes. While no producer has named fourth quarter prices, it is expected that present prices will be reaffirmed.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	2.95c.
Soft steel bars	2.75c.
Reinforc. steel bars	1.75c. to 1.95c.
Cold-fin. rounds and hex	3.10c.
Cold-fin. flats and sq.	3.60c.
Hoops and bands, No. 12 to ¼ in., inclusive	3.00c.
Hoops and bands, No. 13 and lighter	3.55c.
Cold-finished strip	*5.55c.
Hot-rolled annealed sheets (No. 24)	3.60c.
Galvanized sheets (No. 24)	4.60c.
Hot-rolled sheets (No. 10)	3.00c.
No. 9 ann'l'd wire, per 100 lb.	$2.25
No. 9 galv. wire, per 100 lb.	2.70
Com. wire nails, base per keg	2.10

*Net base, including boxing and cutting to length.

WIRE PRODUCTS

Present prices of 2.20c., Cleveland, for manufacturers' wire, $1.90 a keg to jobbers for nails and $2 to retailers have been reaffirmed for the fourth quarter. Jobbers are still getting nail shipments against old contracts at lower prices. Call for manufacturers' wire is very light owing to limited operations of bolt and nut makers.

BOLTS, NUTS AND RIVETS

Demand for these products shows no improvement. Rivet manufacturers are revising contracts to conform to the recent $5 a ton reduction on large rivets.

SHEETS

Several of the automobile manufacturers have sent out inquiries for parts for new car models. Blue prints that accompanied the inquiries indicate many changes in body designs. While this prospective business has stimulated inquiry for sheets, automobile manufacturers are expected to act rather slowly in placing orders. The volume of actual business was very light the past week. The Ford Motor Co. is one of the manufacturers that has issued inquiries for new parts, including frames and running boards. The Ford drawings indicate that the company's new model will have an 8-in. longer frame, longer running boards and generally will be a heavier car than the present models. Electric refrigerator manufacturers are understood to be planning a large production schedule for 1932. Additional mills have announced the reestablishment of present prices for the fourth quarter, and a small amount of business has been taken for October shipment. Regular prices are being firmly maintained on current orders.

STRIP STEEL

Additional mills have announced the reestablishment of present prices on both hot and cold-rolled strip for the fourth quarter, but this is not proving of much interest to consumers, as they are buying only in small lots for immediate needs. Makers of lamps and other automobile

(*Concluded on Page* 798)

NEW YORK

New York Central to Buy 2300 Tons of Car Steel

NEW YORK, Sept. 15.—The local pig iron market has experienced an extremely quiet week. The passive consumer interest in new contracts is reflected by an almost total lack of general inquiry. Sales for the week aggregated about 3000 tons, compared with a like amount the week before and 6000 tons two weeks ago. Improvement in shipping releases continues to indicate slightly better foundry melt, and, with long-standing contracts nearing completion, sellers expect that at least a moderate buying movement will be imperative in the near future.

Southern iron, which has been moving in limited quantities, is still quotable at $11, Birmingham. Foreign iron continues to be a non-competitive factor in the district and maintains interest only for mixture purposes. The weakness recently noted on eastern Pennsylvania quotations is further indicated by the reported waiving of silicon differentials between the No. 2 and No. 2X grades.

Prices per gross ton, delivered New York district:

*Buff. No. 2, del'd east. N. J.	17.78 to 18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	16.89 to 17.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $1.39 to $2.52 from eastern Pennsylvania.
*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

FINISHED STEEL

Thus far in September the local steel trade has looked in vain for the anticipated pick-up in buying. The volume of orders has remained about the same in the first two weeks of September, showing no perceptible gain over the low rate of August. The New York Central Railroad will soon place orders for 2300 tons of plates, shapes and bars for 500 cars it will build in its own shops, but no other sizable orders are in sight except in the structural field, where a number of large projects, previously reported, are still pending.

Most of the sheet and strip mills have reaffirmed present prices for the fourth quarter. Present prices on wire products have also been reestablished. An announcement regarding the tin plate price is expected about Oct. 1.

Of the minor uses for steel, one of the most active lines of consumption is razor blade manufacture. For some unaccountable reason, the demand for this grade of steel is at almost 100 per cent of capacity. Similarly good conditions are found in some cutlery grades, such as are used for manicure implements.

CAST IRON PIPE

Interest in pressure pipe for municipal work is practically dormant, and little prospective business for private interests is in evidence. Awards during the past week included 600 tons of 12-in. for Boonton, N. J., to R. D. Wood & Co., and 900 tons of small sizes for Rocky Hill, Conn., to the same maker. The Warren Foundry & Pipe Corpn. took 250 tons of 10 and 12-in. for the State project at Long Lake, N. Y., and a like amount for a northern New Jersey public utility. Prices on normal tonnages are unchanged, but on some sizable lots recently placed concessions of $2 a ton were made.

Prices per net ton delivered New York: Water pipe, 6-in. and larger, $32.90; 4-in. and 5-in., $35.90; 3-in., $42.90. Class A and gas pipe, $3 extra.

REINFORCING BARS

Quotations are unchanged at 1.60c., Pittsburgh, or 1.93c., New York, with concessions of $1 and more a ton, on sizable projects. Most of the new reinforced concrete projects are small, requiring under a carload lot of bars. The largest tonnage pending in this district is 5525 tons required for foundations of the Inland Freight Terminal to be erected in New York by the Port of New York Authority.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. scrap, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.50c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

OLD MATERIAL

About the only active grades of scrap are No. 1 heavy melting steel, which is being shipped to the consumer at Coatesville, Pa., and by barge to Buffalo, and cast scrap, small tonnages of which are being shipped to Coatesville and Phoenixville, Pa., and Florence, N. J. Prices are generally unchanged on all grades, and dealers report a sufficient supply to satisfy the present small requirements of consumers. The mill at Claymont, Del., has postponed deliveries of No. 1 steel on contracts, and a Phoenixville consumer is delaying deliveries of No. 2 steel and machine shop turnings.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$5.00 to	$6.25
Heavy melting steel (yard)	3.00 to	3.50
No. 1 hvy. breakable cast.	6.50 to	7.00
Stove plate (steel works)		4.00
Locomotive grate bars		4.00
Machine shop turnings	2.00 to	2.50
Short shoveling turnings		2.50
Cast borings (blast fur. or steel works)	2.50 to	3.00
Mixed borings and turnings		2.00
Steel car axles	12.75 to	13.00
Iron car axles	15.00 to	15.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)	5.50 to	6.00
Forge fire	3.50 to	4.00
No. 1 railroad wrought		8.25
No. 1 yard wrought, long		7.25
Rails for rolling	6.25 to	6.75
Stove plate (foundry)	4.75 to	5.50
Malleable cast (railroad)	6.50 to	7.00
Cast borings (chemical)	8.00 to	8.50

Prices per gross ton, deliv'd local foundries:

No. 1 machinery cast	$10.00
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)	8.00
No. 2 cast (radiators, cast boilers, etc.)	7.00

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Use of Steel for Store Fixtures Growing

Great possibilities are seen by the General Fireproofing Co., Youngstown, in the development of store fixtures made of steel. A number of such installations have been made, and the company says that the field has not even been scratched. The Fireproofing company now manufactures 3400 stock items. The company has produced 200,000 steel desks in the past few years. It finds a growing tendency, where new buildings are planned, to fully equip them with steel office furniture, steel partitions, metal lath, steel paneling and the like. This field is being especially cultivated in the case of hospitals, the company states, and it has filled a number of large orders for complete hospital equipment made of steel.

PHILADELPHIA Steel Mill Rates Unchanged—Pipe Shops Buy Pig Iron

PHILADELPHIA, Sept. 15.—Some mills are quoting on a slightly larger volume of new business, but steel operations continue under 30 per cent of capacity. Inquiries from smaller boiler and structural steel fabricating shops are better, but sheet buying is still at the low level of the past few weeks. One of the three leading radio manufacturers is maintaining the high production rate of recent weeks and is buying small lots of various grades of sheets. Sizable sheet tonnages in prospect include about 500 tons of galvanized or special alloy sheets for ventilation ducts in the new Pennsylvania Railroad station in Philadelphia.

Among projects requiring substantial tonnage are a building in Washington for the United States Supreme Court, calling for about 14,000 tons of structural steel, and two transport barges for railroad cars, requiring 11,000 tons of plates and shapes, to be used by the Overseas Railway Co. for movement of freight cars from American ports to Cuba. These barges will be built by the Sun Shipbuilding Co. Of the 11 destroyers inquired for by the Navy Department, six will probably be constructed in private shipyards and five by the Government.

PIG IRON

A few foundries making hardware and plumbing specialties have recently booked more business, but in most cases foundry operations are limited to a few days a week. Foundry iron sales continue to be small, with sellers quoting $16 a ton, eastern Pennsylvania furnace, on carload lots and occasionally waiving the usual 50c. extra for No. 2X grade. On the larger lots, $16 a ton, furnace, is shaded. Two cast iron pipe producers in this district are reported to have closed on sizable tonnages of Northern foundry iron. Southern foundry iron is being maintained at $11 a ton.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$16.26 to $16.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	16.76 to 17.26
East. Pa. No. 1X	17.26 to 17.76
Basic (del'd east. Pa.)	16.75
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

STEEL BARS

Buying is in small volume. The price is unchanged at 1.60c a lb., Pittsburgh, or 1.89c., delivered Philadelphia. Billet steel reinforcing bars are quoted at 1.60c., Pittsburgh, or 1.89c., Philadelphia, with concessions of $1 a ton and more on desirable contracts. Rail steel bars range from 1.20c. to 1.30c., Pittsburgh, or 1.49c., to 1.59c., Philadelphia. Award is expected soon of 800 tons of reinforcing bars for a public school at Fifty-ninth and Malvern Streets, Philadelphia. A branch for Swift & Co. in Wilkes-Barre, Pa., will require 170 tons of bars.

SHAPES

Fabricators are quoting on a slightly larger number of small projects. Mills are quoting 1.70c., f.o.b. nearest mill to consumer, or 1.76c., Philadelphia, for shapes. On the more desirable tonnages, concessions of $1 a ton are usually granted.

PLATES

Mill operations are generally under 30 per cent of capacity, but inquiry is beginning to improve, especially from small users, who have bought little in recent months. The quotation is unchanged at 1.70c., f.o.b. Coatesville, Pa., or 1.80½c., delivered Philadelphia.

SHEETS

Buying has shown little improvement since the holiday lull, but some substantial projects are in prospect, including galvanized sheets for ventilating ducts in the Philadelphia Savings Fund Building totaling about 250 tons and about 500 tons of galvanized or alloy sheets for similar work in the new Pennsylvania Railroad station. One of the local radio manufacturers has been buying small lots of sheets.

IMPORTS

No iron or steel from abroad arrived at this port in the week ended Sept. 12.

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform	2.30c.
Cold-fin. steel, rounds and hex	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ⅞-in. inclu.	2.90c.
Spring steel	5.00c.
Hot-rolled, box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.05c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

OLD MATERIAL

No. 1 heavy melting steel is moving to the consumer at Coatesville, Pa., but the user of No. 2 steel and machine shop turnings at Phoenixville, Pa., and the consumer of No. 1 heavy melting steel at Claymont, Del., are delaying deliveries on contracts. Cast scrap continues in fair demand and is still moving to Phoenixville and Coatesville. A Florence, N. J., foundry, which has been offering to buy heavy breakable cast scrap at $10 a ton, delivered, has reduced the offering price to $9.50 a ton, although some dealers are now willing to sell at $10, delivered.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$8.00 to $9.00
No. 2 heavy melting steel	7.00
No. 1 railroad wrought	10.00 to 10.50
Bundled sheets (for steel works)	6.50
Hydraulic compressed, new	7.00 to 7.50
Hydraulic compressed, old	6.00 to 6.50
Machine shop turnings (for steel works)	5.50 to 6.00
Heavy axle turnings (or equiv.)	8.00 to 8.50
Cast borings (for steel works and roll. mill)	5.50 to 6.00
Heavy breakable cast (for steel works)	10.00 to 10.50
Railroad grate bars	7.50 to 7.75
Stove plate (for steel works)	7.50 to 7.75
No. 1 low phos., hvy. (0.04% and under)	12.00 to 13.00
Couplers and knuckles	11.00
Rolled steel wheels	11.00
No. 1 blast furnace	5.50
Wrot. iron and soft steel pipe and tubes (new specific.)	10.50 to 11.00
Shafting	15.00 to 15.50
Steel axles	16.00 to 16.50
No. 1 forge fire	7.50 to 8.00
Cast iron carwheels	12.00 to 12.50
No. 1 cast	11.00 to 11.50
Cast borings (for chem. plant)	11.50 to 12.00
Steel rails for rolling	10.50

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British Production of Iron and Steel Drops

LONDON, ENGLAND, Sept. 14 (*by cable*).—Output of pig iron in Great Britain in August was 275,700 gross tons, with steel ingots and castings at 375,300 tons. Both showed a decrease from July, in which month production was 317,000 tons of pig iron and 428,700 tons of steel ingots and castings.

Production for the first eight months of 1931, with comparisons of monthly averages of recent years, and of 1913, are shown below:

Date	Pig Iron	Steel
1913	855,000	638,500
1928	550,800	710,000
1929	632,400	804,600
1930	516,400	608,200
1931—January—	337,200	402,200
February	318,200	486,400
March	357,100	500,100
April	323,200	397,400
May	346,500	425,100
June	323,800	428,900
July	317,000	428,700
August	275,700	375,300

CINCINNATI

Pig Iron Shipments Gaining Slightly—No Trend in Steel

CINCINNATI, Sept. 15.—Movement of pig iron on old commitments has recently shown an encouraging gain, as consumers replenish their stocks to care for immediate requirements or in anticipation of better business this fall. Bookings last week declined to about 1300 tons, of which about 200 tons was Southern iron.

Prices per gross ton, deliv'd Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

FINISHED STEEL

While the sheet market shows no particular trend, a slight increase in automotive demand last week made fresh bookings a shade better than those of the preceding three or four weeks. Operations are still a little less than 40 per cent of capacity.

OLD MATERIAL

The scrap market is without feature. Published dealers' bids are nominal.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$7.00 to	$7.50
Scrap rails for melting	9.00 to	9.50
Loose sheet clippings	3.50 to	4.00
Bundled sheets	6.00 to	6.50
Cast iron borings	3.75 to	4.25
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.50 to	6.00
No. 2 busheling	3.50 to	4.00
Rails for rolling	9.50 to	10.00
No. 1 locomotive tires	9.00 to	9.50
No. 2 railroad wrought	7.00 to	7.50
Short rails	12.50 to	13.00
Cast iron carwheels	9.00 to	9.50
No. 1 machinery cast	10.50 to	11.00
No. 1 railroad cast	9.50 to	10.00
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Brake shoes	4.25 to	4.75
Agricultural malleable	8.00 to	8.50
Railroad malleable	9.00 to	9.50

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb.	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

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BUFFALO

Steel Mill Operation Continues at Recent Low Rate

BUFFALO, Sept. 15.—Some of the larger pig iron melters are quietly sounding out the market for the first quarter of 1932. As there has been very little buying for the fourth quarter, these informal inquiries would seem to indicate that some buyers believe that present pig iron prices are low enough to warrant forward covering. Current business consists chiefly of a fairly steady flow of small orders. Shipments this month have been slightly larger than those of August.

Prices per gross ton f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

FINISHED STEEL

Buffalo steel mills are operating at about the rate that has prevailed during the past month or more. The Republic plant is idle this week, but operated three open-hearths, a blooming mill and a bar mill last week. The Republic plant has been operating alternate weeks since early in August. The Seneca Iron & Steel Co. is producing sheets at about 40 per cent of capacity. The Wickwire Spencer company has two open-hearths in service. Buffalo structural steel fabricators booked two jobs during the week, one an addition to a Buffalo store requiring 100 tons and the other 185 tons for a State highway bridge in Wyoming County.

OLD MATERIAL

Sales of No. 1 cast, including one lot of 500 tons, have been made at $10.50. One consumer is still offering $9 for No. 1 heavy melting steel and $7.50 for No. 2 heavy melting steel without obtaining much.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$9.00
No. 2 heavy melting scrap	$7.50 to	8.00
Scrap rails	9.50 to	10.00
Hydraul. comp. sheets		7.50
No. 2 hydraul. comp. sheets		7.00
Hand bundled sheets		7.00
Drop forge flashings		7.50
No. 1 busheling	7.50 to	8.00
Hvy. steel axle turnings	8.00 to	8.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Acid Open-Hearth Grades:		
Knuckles and couplers	10.50 to	11.00
Coil and leaf springs	10.50 to	11.00
Rolled steel wheels	10.50 to	11.00
Low phos. billet and bloom ends	12.50 to	13.00
Electric Furnace Grades:		
Short shov. steel turnings	6.50 to	7.00
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	4.50 to	5.00
Rolling Mill Grades:		
Steel car axles	15.00 to	15.50
Iron axles	16.00 to	16.50
Cupola Grades:		
No. 1 machinery cast	10.00 to	10.50
Stove plate	8.25 to	8.50
Locomotive grate bars	7.00 to	7.50
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.50 to	11.00
Malleable Grades:		
Industrial	10.00 to	10.50
Railroad	10.00 to	10.50
Agricultural	10.00 to	10.50
Special Grades:		
Chemical borings	9.00 to	9.50

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

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1929 Machine Tool Sales Totaled $240,273,000

WASHINGTON, Sept. 15.—Sales in 1929 by 280 machine tool plants totaled $240,273,000, according to the Census of Distribution, and 58.4 per cent, or $140,290,000 worth, was sold direct to users, such as manufacturers, railroads, machine shops, etc. Manufacturing plants sold 11.9 per cent, or $28,639,000 worth, to their own sales branches for resale to dealers and users. The remaining 29.7 per cent, or $71,344,000, was sold to dealers. Of the sales to dealers and users, $38,301,000 was made through manufacturers' agents, selling agents, brokers, or commission houses by 80 manufacturing plants employing such agencies, 18 of which sold their entire output in this way.

The report covers sales channels used by the 280 plants which are engaged primarily in making power-driven machines for cutting or shaping metals, such as lathes, planers, drilling machines, etc. Machine tools manufactured in this industry are designed for more or less general use, as distinct from machines designed for manufacturing special articles. Plants making portable hand tools (power driven) for calking, riveting, and driving screws are also included, as are sales of other products, such as parts and attachments, made by the plants in the machine tool industry.

BIRMINGHAM

No Improvement Discernible in Pig Iron, Steel or Cast Iron Pipe

BIRMINGHAM, Sept. 15.—The pig iron situation does not show any tendency toward improvement. Bookings are generally for a carload at a time, except from a few of the larger melters who order out a week's supply. No interest has yet been shown in fourth quarter tonnage. August production was the lowest for any month in 10 years. Even on the present basis of only eight active furnaces, output is not being absorbed. Six of the eight active stacks belong to merchant producers and all of them continue to add to their yard stocks. For some time there has been talk of at least one or two more furnaces being blown out if conditions did not improve, but this has not yet been done. Quotations on district tonnage remain on a basis of $12.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50
Basic	12.00

FINISHED STEEL

Bookings are holding to the low levels of the past several weeks. Fabricators of structural steel and reinforcing bars had one of the quietest weeks in recent months, new business consisting only of a few small orders. Bar tonnage has been receding, as road and bridge construction approaches the end for this year. Quotations of finished steel products are without change. The Tennessee company continues to operate six open-hearths at Fairfield and the Gulf States Steel Co. has three on at Alabama City, a total of nine active in Alabama. This has been the schedule of the past three weeks.

CAST IRON PIPE

New pipe tonnage has grown lighter, if anything, and the Birmingham plants continue to look from week to week for the tonnage necessary to sustain operations, which vary from 40 to 50 per cent. Most of the new orders do not exceed a carload or two. The price situation is somewhat confused, as Eastern competition is under the nominal base of $35 to $36, Birmingham.

OLD MATERIAL

There is practically no activity. Mills have been holding up shipments on contracts and new business has been very light. Prices are unchanged.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$8.50 to $9.00
Scrap steel rails	8.50
Short shoveling turnings	6.50
Cast iron borings	(No market)
Stove plate	7.00
Steel axles	15.00 to 16.00
Iron axles	18.00
No. 1 railroad wrought	8.00
Rails for rolling	11.50 to 12.00
No. 1 cast	9.00
Tramcar wheels	10.00 to 10.25
Cast iron borings, chem.	13.50

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ST. LOUIS

Pig Iron Buying Still Confined to Small Lots—Scrap Dull

ST. LOUIS, Sept. 15.—Business in pig iron still is confined to small orders for prompt shipment. Makers are said to be concerned more with getting shipping specifications against contracts than in obtaining new business. Despite the small volume of business now being placed, the market continues firm. The melt of steel mills in the district is estimated to be about 25 per cent of capacity. The business of stove plants has been good and likely will continue to be throughout this month and into the middle of October. Foundries serving the implement trade are nearing the end of their order files.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., deliv'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

FINISHED STEEL

Sheet prices for fourth quarter have been established on the same basis as for the preceding period. Prices have been well maintained thus far. Structural steel fabricators report business is extremely dull, with no sizable projects in sight in this district. Warehouse business continues quiet.

OLD MATERIAL

Partial relief was afforded by one consumer to the stopping of shipments against contracts, which has made the situation here difficult for dealers. With consumers not only out of the market but holding up shipments of material bought, dealers are buying nothing except an occasional bargain to lay down in their yards. Prices are unchanged.

Railroad lists: Missouri-Kansas-Texas, 3721 tons; Louisville & Nashville, 2400 tons; Wabash, 1250 tons; Chicago, Rock Island & Pacific, 65 carloads; St. Louis-San Francisco, 34 carloads; Chicago, Indianapolis & Louisville, 11 carloads; Nashville, Chattanooga & St. Louis, 8 carloads, and Pullman Co., St. Louis, 5 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$7.75 to $8.25
No. 1 heavy melting or shoveling steel	7.50 to 8.00
No. 2 heavy melting or shoveling steel	7.00 to 7.50
No. 1 locomotive tires	9.00 to 9.50
Misc. stand.-sec. rails including frogs, switches and guards, cut apart	8.50 to 9.00
Railroad springs	8.75 to 9.25
Bundled sheets	5.00 to 5.50
No. 2 railroad wrought	7.50 to 8.00
No. 1 busheling	6.25 to 6.75
Cast iron borings and shoveling turnings	5.25 to 5.75
Iron rails	7.00 to 8.00
Rails for rolling	10.50 to 11.00
Machine shop turnings	3.00 to 3.50
Heavy turnings	6.00 to 6.50
Steel car axles	11.50 to 12.00
Iron car axles	15.00 to 15.50
Wrot. iron bars and trans.	6.00 to 6.50
No. 1 railroad wrought	5.00 to 5.50
Steel rails, less than 3 ft.	11.00 to 11.50
Steel angle bars	7.50 to 8.00
Cast iron carwheels	6.75 to 7.25
No. 1 machinery cast	8.00 to 8.50
Railroad malleable	6.50 to 7.00
No. 1 railroad cast	7.50 to 8.00
Stove plate	7.00 to 7.50
Relay. rails, 60 lb. and under	16.00 to 16.50
Relay. rails, 70 lb. and over	20.00 to 21.00
Agricult. malleable	6.50 to 7.00

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.15c.
Boiler rivets	4.15c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	70
Carriage bolts	70
Lag screws	70
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	70
Less than 200 lb.	60

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Canada

Dominion Business Shows Little Improvement

TORONTO, Sept. 14.—Demand for pig iron in the Canadian market shows little improvement. Inquiries appeared in better volume toward the close of last week, but sales were confined to small lots. Evidence of fourth quarter buying is lacking, and prospects for any heavy buying for that period are poor. Prices are unchanged.

Prices per gross ton:

Delivered Toronto	
No .1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	20.50

STRUCTURAL STEEL

Bookings for the week were somewhat better than for the preceding week, but generally involved small lots. Prospective business in the Toronto district is featured by the building addition for the Ontario Hydro-electric Commission. About 10,000 tons of structural steel for bridge

work in the Montreal district is expected to be placed shortly.

OLD MATERIAL

Business continues at low ebb, with orders restricted to car lots for special grades. Iron grades are responsible for the bulk of new orders. Demand for heavy melting steel and turnings has been virtually dormant, due to the absence of the mills from the market during the past several days. Prices are unchanged.

Dealers' buying prices for old material:

Per Gross Ton

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	....	10.00
Stove plate	....	8.00
Standard carwheels	....	8.50
Malleable	....	8.00

Per Net Ton

No. 1 machinery cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

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Electric Hoist Orders Gain

Members of the Electric Hoist Manufacturers Association report that the number of hoists ordered during August increased 7.5 per cent as compared with the previous month, and the value of such orders increased 3.4 per cent. Shipments were 47.32 per cent smaller in August than in July.

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International-Stacey Corpn., Columbus, Ohio, has transferred its Michigan headquarters from Jackson to the Stephenson Building, Detroit. A. G. Bradbury, formerly in charge of International Derrick & Equipment Co.'s Detroit office, is division manager.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	*3.35c.
Structural shapes—	
Angles and beams	*3.35c.
Tees	*3.35c.
Zees	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.
	Per Cent Off List
Machine bolts	65 and 5
Carriage bolts	65 and 5
Lag screws	65 and 5
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

BOSTON

Pig Iron Market Almost at Standstill—Scrap Market Also Dull

BOSTON, Sept. 15.—With the New England foundry melt at a scant 20 per cent of rated capacity, the pig iron market is almost at a standstill. The largest individual sale made the past week was 100 tons, prompt delivery, to the Saco-Lowell Shops, while the aggregate business fell considerably short of 1000 tons. There is nothing to indicate when a buying movement will start.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91
*Buffalo, sil. 2.25 to 2.75	19.91
†Buffalo, sil. 1.75 to 2.25	19.28
†Buffalo, sil. 2.25 to 2.75	19.28
*Ala., sil. 1.75 to 2.25	$20.11 to 20.61
*Ala., sil. 2.25 to 2.75	20.61 to 21.11
†Ala., sil. 1.75 to 2.25	16.75
†Ala., sil. 2.25 to 2.75	17.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

WAREHOUSE BUSINESS

Warehouses have made slight price reductions on beams, channels, angles, tees, zees, plates, merchant bars, small shapes, bands, hoop steel and reinforcing bars. In addition they have established price differentials on quantity shipments of beams, channels, angles, tees, zees, plates, soft steel bars and small shapes and band steel. The base price on such materials is established on lots of 250 to 999 lb. For less than such quantities the buyer must add 50c. per 100 lb. to the base price; on 1000 to 7999 lb. lots, deduct 15c. from the base price, on 8000 to 14,999 lb. lots, deduct 25c., and on 15,000 lb. and larger lots, deduct 35c. The weight which governs is the combined weight of all of the items of specified products only, on orders placed at one time for shipment at one time.

CAST IRON PIPE

Rocky Hill, Conn., has placed 1000 tons of 6 to 10-in. pipe with R. D. Wood & Co.; Waterbury, Conn., bought 300 tons of 6, 8 and 12 in. from the Donaldson Iron Co. The Warren Pipe Co. of Massachusetts sold 250 tons to New York State for a Long Lake job; 500 16 ft. lengths of 12 in. to the Brooklyn Union Gas Co.; a small tonnage of 6 to 24-in. to Boston at $36.50 a ton, delivered, or $30.70 a ton, foundry; and took a small amount of business from various New England municipalities. There are no sizable prospects in the market. Foundries are anxious for business, and consequently prices are elastic.

FABRICATED STEEL

With five Massachusetts bridges, calling for 570 tons, a Federal job at Hartford, Conn., needing 1400 tons, a Springfield, Mass., memorial building of 1500 tons, and a bridge across the Connecticut River between Hartford and East Hartford, calling for at least 2000 tons, the outlook for lettings the remainder of this month is somewhat more encouraging.

REINFORCING STEEL

There are many small jobs in prospect, an encouraging sign to sellers. Lettings the past week were 140 tons for Massachusetts road work, 120 tons for two State bridges and approximately 200 tons for small work. Prices from stock quoted openly are: billet steel bars, in 1 to 5-ton lots, 3c. a lb., base; in 6 to 99-ton lots, 2.40c.; in 100-ton lots and larger, 2.30c.; rail steel bars, 2.26½c. a lb., delivered Boston.

OLD MATERIAL

Brokers have no steel mill orders, and New England foundries are not doing enough to be a factor in the cast scrap market. The feeling persists, however, that business will improve before the end of September.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$4.50 to $5.00
Scrap T rails	4.00 to 4.50
Scrap girder rails	3.00 to 3.50
No. 1 railroad wrought	7.00 to 7.50
Machine shop turnings	1.25 to 1.80
Cast iron borings (steel works and rolling mill)	1.50 to 1.75
Bundled skeleton, long	3.00 to 3.25
Forged flashings	5.00 to 5.25
Blast furnace borings and turnings	1.50 to 1.75
Forge scrap	0.50 to 0.80
Shafting	10.00 to 10.50
Steel car axles	11.00 to 12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	5.00 to 5.25
Rails for rolling	7.50 to 8.00
Cast iron borings, chemical	7.00 to 7.25
No. 2 cast	5.00 to 5.25

Prices per gross ton deliv'd consumers' yards:

Textile cast	$9.50 to $10.00
No. 1 machinery cast	9.50 to 10.00
Stove plate	5.00 to 5.25
Railroad malleable	13.00 to 13.50

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Detroit Scrap Market Is Weaker

DETROIT, Sept. 15.—Lack of consumer interest, coupled with fairly sizable stocks in the hands of dealers, has resulted in weaker prices, hydraulic bundles and stove plate having dropped 25c. a ton and sheet clips 50c. Quotations on heavy melting steel are less stable, although unchanged. On account of purchases by a local blast furnace interest, No. 2 busheling is up 75c. a ton.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$6.50 to $7.00
Borings and short turnings	4.50 to 5.00
Long turnings	4.00 to 4.50
No. 1 machinery cast	8.00 to 8.50
Automotive cast	11.00 to 11.50
Hydraul. comp. sheets	6.25 to 6.75
Stove plate	5.00 to 5.50
New No. 1 busheling	5.25 to 5.75
Old No. 2 busheling	3.25 to 3.75
Sheet clippings	3.50 to 4.00
Flashings	5.50 to 6.00

PACIFIC COAST

SAN FRANCISCO, Sept. 14.—The annual State Fair and a 10-day fiesta at Los Angeles probably interfered somewhat with what little business activity there might have been during the past week. Mid-September therefore finds the Pacific Coast iron and steel trade without progress toward the expected fall recovery.

BARS

Total awards on large contracts were 2570 tons, including 1200 tons for a fish harbor mole at Los Angeles, placed with the Soule Steel Co. by Merritt, Chapmann & Scott, general contractors. New inquiries total 1900 tons.

PLATES

Lettings were 825 tons; 330 tons was entered as new inquiries. This continues to be the weakest department in the Pacific Coast market.

CAST IRON PIPE

The Pacific States Cast Iron Pipe Co. will furnish 465 tons of 6 to 12-in. class 150 pipe to Helena, Mont. Inquiries for 211 tons include 137 tons of Class B, 4 to 8-in. pipe for Anaheim, Cal., on which bids close Sept. 22.

RAILWAY SUPPLIES

The United Commercial Co. of Los Angeles was awarded contract for 104 tons of 65 lb. relaying rails for city levee construction at $24.80. Seattle is in the market for 500 tons of girder rails for the municipal street railway.

SHAPES

There has been very little activity, with only 590 tons of awards and 450 tons of new inquiries. The Board of Harbor Commissioners at San Francisco has announced a contemplated construction program involving an estimated expenditure of almost $1,500,000 and including a $200,000 steel frame and concrete shed at Pier 20 and a steel frame and concrete cotton terminal.

California State Fair and Los Angeles Fiesta Curb Business

F.O.B. Warehouse Prices

(Less than 5000 Lb.)

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	2.80c.	3.00c.	2.40c.
Soft steel bars	2.80c.	3.00c.	2.40c.
Reinforcing bars	2.80c.	2.80c.	3.00c.
Hot-rolled annealed sheets (No. 24)	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10)	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	3.75c.
Struc. rivets, ½ in. and larger, less than 1000 lb.	5.00c.	5.00c.	5.50c.
Special nails: common 4 to 60d; smooth box 4 to 20d; finish 6 and 8d; base per keg	$2.55	$2.45	$2.40
Other wire nails, base per keg	2.80	2.70	2.65
Cement c't'd nails, 100-lb. keg	2.65	2.70	2.65

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Steel Industry's Output in 1929 Valued at Nearly 3 Billions

WASHINGTON, Sept. 15.—Making total sales of $2,990,926,000 in 1929, according to the Census of Distribution, 480 steel works and rolling mills disposed of $1,701,680,000 worth or 56.9 per cent of their products to industrial consumers. Chief among these consumers, the Bureau of Census lists manufacturers of iron and steel products, boiler and machine shops, railroads, other rolling mills, etc.

Manufacturing plants sold 3.7 per cent or $112,125,000 worth of their goods to their own sales branches for resale to dealers and consumers. The remaining sales, amounting to 39.4 per cent, or $1,177,121,000, were made to dealers.

Of sales to dealers and industrial consumers, $106,271,000 was made through manufacturers' agents, selling agents, brokers or commission houses. Eighty manufacturing plants sold through such agents, six of them selling their entire output in this way. The report consequently shows the sales channels used by 480 plants manufacturing for sale.

These plants are engaged either in the conversion of pig iron, ferroalloys, and scrap into steel ingots and castings, or in the rolling of iron and steel.

Fabricated Wire Products Totaled $147,921,000

Total sales in 1929 by 547 plants engaged in manufacturing fabricated wire products amounted to $147,921,000, of which $63,256,000 worth or 42.4 per cent went to wholesalers and $65,178,000 worth, or 44.1 per cent went to consumers. The report covers producers making wire products from purchased wire.

Manufacturing plants sold 4.5 per cent or $6,693,000 worth of their goods to their own wholesale branches for resale to dealers or consumers. The remaining 8.6 per cent, or $12,794,000, was sold to retailers. Of the sales to dealers and consumers $7,567,000 was sold through manufacturers' agents, selling agents, brokers or commission houses. Seventy-two manufacturing plants sold through such agents, 19 of them selling their entire output in this way.

The report does not include plants making fabricated wire products as secondary material, such as wire mills drawing wire from purchased rods, rolling mills, mattress and bed spring factories, etc. The total value of fabricated wire products in all industries is $366,478,493. The sale of 40 per cent of these products is included in the report, the remaining 60 per cent being included in the distribution of sales reports for the industries within which it is manufactured.

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Short-Haul Freight Rates on Steel Delayed

WASHINGTON, Sept. 15. — Further delay in establishing reduced rates on iron and steel shipments of 100 miles and less in Central Freight and Trunk Line territories is seen in a new application just made for the railroads to modify the recent and second long-and-short haul order issued by the Interstate Commerce Commission. The railroads now are seeking the right to file a blanket tariff covering routes within the rules prescribed without the necessity of naming the lines over which the traffic would move. The reason assigned is that of economy, since an individual tariff for each carrier would not have to be filed.

Action on this application has to be taken before the carriers renew the short notice application seeking to establish the reduced rates in less than statutory time or 30 days.

In some quarters it is doubted that the carriers will now seek to establish the reduced short haul rates, if at all, until after the commission passes upon the 15 per cent rate increase case. Arguments in this latter case begin next Monday.

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Public Works Contracts $42,806,062 in Week

WASHINGTON, Sept. 15.—Public and semi-public works contract awards amounting to $42,806,062 were reported to the Public Works Section of the President's Organization on Unemployment Relief last week. The addition of this sum brought the total of awards reported since Dec. 1, 1930, to $2,380,925,109.

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Herbert Action Segal & Co., Newark, N. J., has moved its general offices to the Action Building, 8 Center Street.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 27c.
Manganese ore, African or Indian, 50 to 52%	24c. to 26c.
Manganese ore, Brazilian, 46 to 48%	22c. to 24c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50

	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.56
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, ¾-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.60 to .75
Gas slack, f.o.b. W. Pa. mines	.60 to .75

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$80.00 to $85.00
Foreign, 80%, Atlantic or gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		Per Gross Ton Furnace	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	31.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton	
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio Furnace

Per Gross Ton		Per Gross Ton	
6%	$20.00	11%	$23.00
7%	20.50	12%	24.00
8%	21.00	13%	26.00
9%	21.50	14%	28.00
10%	22.00	15%	30.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$13.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcuim fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00	$32.00 to $35.00
Maryland	40.00	32.00 to 35.00
New Jersey	44.00 to 59.00	.....
Ohio	40.00	32.00 to 35.00
Kentucky	40.00	32.00 to 35.00
Missouri	37.00	32.00 to 35.00
Illinois	40.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73 and 10
†Carriage bolts	73 and 10
Lag bolts	73 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square,	73 and 10
Hot-pressed nuts, blank or tapped, hexagons,	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅝ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.,	73 and 10
Stove bolts in packages, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland.	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland,	80, 10, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.50
F.o.b. Chicago	2.60

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened,	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread,	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
Del'd Philadelphia	1.89c.
Del'd New York	1.93c.
F.o.b. Cleveland	1.65c.
F.o.b. Lackawanna	1.70c.
F.o.b. Birmingham	1.70c.
C.i.f. Pacific ports	2.00c.

Billet Steel Reinforcing

F.o.b. P'gh mills, 40, 50, 60-ft.	1.60c.
F.o.b. Birmingham, mill lengths	1.75c.
F.o.b. Cleveland	1.55c. to 1.60c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.30c. to 1.35c.
F.o.b. Chicago Heights mill	1.60c.
Del'd Philadelphia	1.49c. to 1.59c.

Iron

Common iron, f.o.b. Chicago	1.70c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.80½c.
F.o.b. Coatesville	1.70c.
F.o.b. Sparrows Point	1.70c.
F.o.b. Lackawanna	1.70c.
Del'd New York	1.88c.
C.i.f. Pacific ports	1.85c. to 1.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.60c.
F.o.b. Chicago	1.70c.
F.o.b. Birmingham	1.70c.
F.o.b. Lackawanna	1.70c.
F.o.b. Bethlehem	1.70c.
Del'd Cleveland	1.78½c.
Del'd Philadelphia	1.71c. to 1.76c.
Del'd New York	1.85½c.
C.i.f. Pacific ports	2.05c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh	1.65c.
Wider than 6 in., P'gh	1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.75c. to 1.85c.
Cooperage stock, Chicago	1.85c. to 1.95c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.15c. to 2.25c.
Strips, Cleveland	2.15c. to 2.25c.
Strips, deliv'd Chicago	2.43c. to 2.53c.
Strips, Worcester	2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Base per Lb.
Bright wire	2.20c.
Spring wire	3.20c.

To Jobbing Trade

	Base Per Keg
Standard wire nails	$1.90
Smooth coated nails	1.90
Galvanized nails	3.90

	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.35c.
Galvanized staples	2.60c.
Barbed wire, galvanized	2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00

To Retail Trade

	Base Per Keg
Standard wire nails	$2.00
Cement coated nails	2.00
Galvanized nails	4.00

	Base per Lb.
Smooth annealed wire	2.45c.
Smooth galvanized wire	2.90c.

	Base per Lb.
Polished staples	2.45c.
Galvanized staples	2.70c.
Barbed wire, galvanized	2.65c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$60.00
Woven wire fence, 12½ gage and lighter, per net ton	65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Sheets

Hot-Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.70c.
No. 10, f.o.b. Chicago mills	1.80c.
No. 10, del'd Philadelphia	1.99c.
No. 10, f.o.b. Birmingham	1.85c.
No. 10, c.i.f. Pacific Coast ports	2.33c.

(Note: To above prices are added extras for annealing and for width over 48 in., and for less than five tons of each gage or size.)

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Chicago mills	2.50c.
No. 24, del'd Philadelphia	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, c.i.f. Pacific Coast ports	2.88c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.35c.
No. 10 gage, f.o.b. Chicago mills	2.45c.
No. 10 gage, del'd Philadelphia	2.64c.
No. 10 gage, f.o.b. Birmingham	2.50c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Chicago mills	3.05c.
No. 20 gage, del'd Philadelphia	3.24c.
No. 20, f.o.b. Birmingham	3.10c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh	3.10c.

Steel Furniture Sheets

No. 10, f.o.b. Pittsburgh	2.75c.
No. 10, f.o.b. Pittsburgh	3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring).

Galvanized Sheets

No. 24, f.o.b. Pittsburgh	2.90c.
No. 24, f.o.b. Chicago Mills	3.00c.
No. 24, del'd Philadelphia	3.19c.
No. 24, f.o.b. Birmingham	3.05c.
No. 24, c.i.f. Pacific Coast ports	3.38c.

Long Ternes

No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	3.15c.

Vitreous Enameling Stock

No. 10, f.o.b. Pittsburgh	2.90c.
No. 20, f.o.b. Pittsburgh	3.40c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Chicago mills	2.75c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills	$5.00
Standard cokes, f.o.b. Gary	5.10

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$16.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(1¼% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Round and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.70
Spikes, ½ in. and larger	2.70
Spikes, boat and barge	2.90
Tie plate, steel	1.95
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Iron Inches	Iron Black	Iron Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18

Lap Weld

2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49⅛	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			

Lap Weld, extra strong, plain ends

2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1¼ points with supplementary discounts of 5 and 2½%. On iron pipe both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1⅝ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2 in.—2¼ in.	13
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		

Hot Rolled

2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper Prices Decline—Tin and Zinc Weak—Lead Firm

NEW YORK, Sept. 15.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Sept. 15	Sept. 14	Sept. 12	Sept. 11	Sept. 10	Sept. 9
Lake copper, New York	7.62½	7.62½	7.62½	7.87½	7.87½	7.87½
Electrolytic copper, N. Y.*	7.00	7.00	7.25	7.25	7.25	7.25
Straits tin, spot, N. Y.	25.45	25.45	....	25.65	25.75	25.62½
Zinc, East St. Louis	3.75	3.75	3.77½	3.80	3.80	3.80
Zinc, New York	4.10	4.10	4.12½	4.15	4.15	4.15
Lead, St. Louis	4.22½	4.22½	4.22½	4.22½	4.22½	4.22½
Lead, New York	4.40	4.40	4.40	4.40	4.40	4.40

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel, electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.50c. to 6.60c. a lb., New York.

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COPPER

The quotation for electrolytic copper continued at 7.50c. a lb., delivered Connecticut Valley, through last week, but yesterday, Sept. 14, small lots began to be available at 7.25c., delivered, although primary producers are still maintaining higher prices. This decline in the domestic price appears despite August statistics that were somewhat better than had been expected by the trade. The net increase in stocks at the end of August is reported as 11,805 tons, refined copper stocks showing an increase of 15,358 tons and blister copper a decrease of 3553 tons. Shipments for the month, both domestic and export, were about 10 per cent better than in July.

The quotation of Copper Exporters, Inc., which has been considered out of line with the domestic market by foreign buyers, was reduced on Sept. 10 to 7.75c. a lb., c.i.f. usual European ports. This brought an immediate buying movement, so that sales to Europe totaled 2000 tons on the day the price was reduced. Subsequent sales were limited to a few hundred tons a day, and foreign transactions yesterday totaled only 45 tons. The lower price prevailing for small lots of copper to domestic users has brought about the same spread to which foreign buyers have previously objected. Export sales of copper to Sept. 15, totaling 7300 tons, are about 500 tons in excess of August business in the same period. Lake copper continues quiet and is quoted at 7.62½c. a lb., delivered.

TIN

Most of the larger domestic users of tin are covered for nearby requirements, and, instead of showing interest in further purchases, are in certain instances asking for postponement of deliveries because of low operating rates. The London market is affected by the European economic conditions, so that transactions in tin are decidedly small. Stocks in London and Liverpool warehouses have declined 253 tons to a total of 31,198 tons, and shipments from Singapore totaled 2074 tons to Sept. 12. At the present rate from the East, the movement of tin for September is likely to be smaller than the estimate for the month of 6000 tons. Spot standard tin in London was quoted today at £113 15s., future standard at £116 5s., spot Straits at £115 15s., and the Singapore price was £119 5s. The tin pool formed recently to support the market is apparently operating with some degree of success. Dealers point out that on Sept. 11 and again on Sept. 14 the pool withdrew from the market and prices immediately dipped 10s. and more a ton.

LEAD

The quotation on virgin metal is unchanged at 4.40c. a lb., New York, and 4.22½c., St. Louis, although remelted lead is being offered at 4.25c. a lb., New York. With the London market considerably depressed in sympathy with other metal prices there, it has been suggested that Mexican lead, usually shipped to London, is nearing a price at which it could be delivered at about 4.40c., New York, duty paid. The current cost of the Mexican product would be about 4.45c., New York. Sellers here, however, point out that users probably would not be inclined to buy comparatively unknown brands except at a substantial discount from the domestic prices. Lead statistics for August are considered highly satisfactory by the trade, consumption having exceeded production for the fourth consecutive month. At 129,000 tons, present stocks of lead are estimated to represent about 60 days' normal requirements, and about 90 days' requirements at present rates of consumption.

ZINC

Current demand is small, but, with consumers still showing no interest in covering forward requirements, sellers believe that substantial fourth quarter business is in prospect. Meanwhile, prices have softened, small quantities of zinc have become available at 3.77½c., East St. Louis, and 4.12½c., New York, on Sept. 12, and sales at 3.75c., East St. Louis, and 4.10c., New York, were made yesterday and today. This weakness in the market developed in spite of a de-

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New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	15.25c.
*Copper, hot rolled, base sizes	17.37½c.
Seamless Tubes—	
Brass	20.00c.
Copper	19.87½c.
Brass Rods	13.50c.
Brazed Brass Tubes	24.12½c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Zinc sheets, open	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	27.50c. to 28.50c.
Tin, bar	29.50c. to 31.50c.
Copper, Lake	9.50c. to 10.50c.
Copper, electrolytic	9.00c. to 9.50c.
Copper, casting	8.75c. to 9.25c.
Zinc, slab	5.00c. to 5.50c.
Lead, American pig	5.25c. to 6.25c.
Lead, bar	7.00c. to 8.00c.
Antimony, Asiatic	9.50c. to 10.50c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	20.00c. to 23.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	20.00c. to 30.00c.
Solder, ½ and ½	17.50c. to 18.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	29.50c.
Tin, bar	31.50c.
Copper, Lake	8.87½c.
Copper, electrolytic	8.87½c.
Copper, casting	8.25c.
Zinc, slab	5.50c. to 5.75c.
Lead, American pig	5.25c.
Lead, bar	7.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	33.50c.
Solder, ½ and ½	19.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.75c.	6.50c.
Copper, hvy. and wire	5.50c.	6.37½c.
Copper, light and bottoms	4.75c.	5.50c.
Brass, heavy	3.00c.	3.75c.
Brass, light	2.50c.	3.25c.
Hvy. machine composition	4.50c.	5.25c.
No. 1 yel. brass turnings	3.50c.	4.00c.
No. 1 red brass or compos. turnings	4.25c.	5.00c.
Lead, heavy	3.25c.	3.75c.
Zinc	1.50c.	2.00c.
Sheet aluminum	9.50c.	11.50c.
Cast aluminum	8.50c.	5.50c.

cline in stocks of zinc at the end of August.

ANTIMONY

Transactions are generally limited to less than carload lots, on which the current quotations for prompt shipment of the Chinese metal are 6.50c. to 6.60c., duty paid, New York. On sizable orders, it is suggested that small concessions might be obtained, in view of more favorable reports from China, where the floods have apparently not greatly curtailed available supplies. As a result, September-October shipment from Hankow is quoted at 6.37½c., New York.

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FABRICATED STRUCTURAL STEEL

Projects of 27,000 Tons Include 14,000-Ton Building for Supreme Court—Awards Total 30,000 Tons

NEW fabricated steel projects of 27,000 tons and awards of 30,000 tons are under the totals of a week ago, when there were 37,000 tons of inquiry and 41,000 tons of contracts. Of this week's new projects, 14,000 tons is for a building for the United States Supreme Court in Washington, 3000 tons for an aircraft shop in San Antonio, Tex., 2000 tons for the Rembrandt High School in Chicago and 1000 tons for highway bridges in Wisconsin. A feature of recent new projects has been a slight increase in the number of private enterprises.

Awards of 30,000 tons include 4000 tons of highway bridges at Morgan City, La., a similar tonnage in an overhead crossing in Cook County, Ill., 2000 tons in an approach to the Illinois River Bridge in Chicago, and the same tonnage in a bridge at Peoria, Ill. Awards follow:

North Atlantic States

BOSTON, 235 tons, Old South Church chapel and parish house, to New England Structural Co.

GREAT BARRINGTON, MASS., 140 tons, State bridge, to Haarman Steel Co.

QUINCY, MASS., 120 tons, city bridge, to Boston Bridge Works, Inc.

NEW YORK, 910 tons, Eye Institute, Columbia University, to Lehigh Steel Construction Co.

NEW YORK, 485 tons, garage on 131st Street, to Lehigh Steel Construction Co.

STATE OF NEW YORK, 340 tons, highway bridge, to Fort Pitt Bridge Works Co.

BROOKLYN, 800 tons, apartment hotel on Lafayette Avenue, to Harris Structural Steel Co.

BROOKLYN, 100 tons, church at Fort Hamilton Parkway and East Fourth Street, to Brooklyn Iron Works.

LAKEHURST, N. J., 180 tons, mooring mast, to Wellman Engineering Co.

ITHACA, N. Y., 375 tons, bank building, to American Bridge Co.

PENNSYLVANIA RAILROAD, 3000 tons, main station platform at Philadelphia, to McClintic-Marshall Corpn.

STATE OF PENNSYLVANIA, 300 tons, highway bridge, to American Bridge Co.

SAFE HARBOR, PA., 500 tons, miscellaneous steel work for Safe Harbor Water Power Corpn., to Bartlett Hayward Co.

BUFFALO, 100 tons, addition to Sattler store, to Ernst Iron Works.

WYOMING COUNTY, N. Y., 185 tons; State highway bridge, to Lackawanna Steel Construction Co.

SCHOHARIE COUNTY, N. Y., 540 tons, bridge, to Spooner Bridge Co., Albany; fabrication by Fort Pitt Bridge Works Co.

WASHINGTON, 160 tons, building for Public Health Bureau, to American Bridge Co.

The South

MORGAN CITY, LA., 4000 tons, State highway bridge, to Mount Vernon Bridge Co.

STATE OF MISSISSIPPI, 1500 tons, bridge, to Tennessee Bridge Co.

CLARKSBURG, W. VA., 620 tons, Court House, to McClintic-Marshall Corpn.

ASHLAND, KY., 590 tons, Winchester Avenue viaduct, to McClintic-Marshall Corpn.

MEMPHIS, TENN., 150 tons, four barges for United States Engineer, to Stupp Brothers Bridge & Iron Co.

DURHAM, N. C., 300 tons for Duke University, to Dietrich Brothers.

Central States

SOUTH BEND, IND., 800 tons, Post Office, to Fort Pitt Bridge Works Co.

SOUTH BEND, 250 tons, power plant at University of Notre Dame, to Edwards Iron Works.

MONROE, MICH., 600 tons, St. Mary's Academy, to Palmer Bee Co.

COOK COUNTY, ILL., 4000 tons, overhead crossing, to Duffin Iron Co., Chicago.

CHICAGO, 815 tons, bridge and ore handling plant for Mead-Morrison Mfg. Co., to McClintic-Marshall Corpn.

CHICAGO, 200 to 300 tons, barges for Pure Oil Co., to Chicago Bridge & Iron Works and Alabama Shipbuilding & Dry Dock Co.

CHICAGO, 2000 tons, east approach to Illinois River bridge, to Duffin Iron Co.

PEORIA, ILL., 2000 tons, Cedar Street bridge, to Duffin Iron Co.

STATE OF ILLINOIS, 2000 tons, highway bridges, to various fabricators.

RIVERTON, ILL., 200 tons, bridge for Wabash Railway, to American Bridge Co.

EMBARRASS, WIS., 125 tons, State highway span, to Milwaukee Bridge Co.

Western States

SAN FRANCISCO, 150 tons, shed for Pier 38, to California Steel Co., Oakland.

BURLINGAME, CAL., 140 tons, novitiate building, to McClintic-Marshall Corpn.

WALLA WALLA, WASH., 200 tons, penitentiary cell block, to Isaacson Iron Works.

SEATTLE, 100 tons, bridge for Union Pacific Railway, to Wallace Bridge & Structural Steel Co.

Canada

MONTREAL, 200 tons, girls' school and residence on Berri Street, to George W. Reid & Co., Ltd.

MONTREAL, 150 tons, office building at 5317 Drolet Street, to Canadian Vickers, Ltd.

TORONTO, 100 tons, garage building for *Evening Telegram*, to Dominion Bridge Co.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

SPRINGFIELD, MASS., 400 tons, two museums.

DIXFIELD, ME., 235 tons, wood-working plant.

HARTFORD, CONN., 2000 tons, Post Office; Coath & Goss, Inc., Chicago, low bidder for general contract.

PAWTUCKET, R. I., 450 tons, Post Office; Edward S. Moore & Son, Kokomo, Ind., low bidders for general contract.

NEW YORK, 150 tons, residence at 117 East Seventieth Street.

NEW YORK, 250 tons, building for Cosmopolitan Club at 122 East Sixty-sixth Street.

NEW YORK, 150 tons, garage at 505 East Sixteenth Street.

NEW YORK, 23,000 tons, Inland Terminal building between Eighth and Ninth Avenues, Fifteenth and Sixteenth Streets; Turner Construction Co., low bidder for general contract.

NEW YORK, 700 tons, building on Broad Street for *Wall Street Journal*.

JAMESTOWN, N. Y., 500 tons, high school.

NEWTOWN SQUARE, PA., 300 tons, Ellis College buildings.

PHILADELPHIA, 200 tons, building for E. I. du Pont de Nemours & Co.

PHILADELPHIA, 300 tons, school at Fifty-ninth and Malvern Streets; John McShain, Philadelphia, general contractor.

WASHINGTON, 14,000 tons, building for United States Supreme Court.

The South

LOUISVILLE, KY., 300 tons, warehouse for R. J. Reynolds Tobacco Co.

STATE OF TEXAS, 1050 tons, highway bridges as follows: Delta and Hopkins Counties, 157 tons; Kimball County, 177 tons; Leon County, 342 tons; Victoria County, 129 tons; Runnells County, 245 tons.

SAN ANTONIO, TEX., 3000 tons, aircraft shop; bids open Sept. 24.

Central States

STATE OF OHIO, 100 tons, highway bridge at Bedford.

TOLEDO, OHIO, 1300 tons, steel pipe.

STATE OF WISCONSIN, 1000 tons, highway bridges.

CHICAGO, 2000 tons, Rembrandt High School.

WYANDOTTE, MICH., 500 tons, power house.

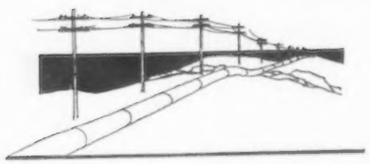
AKRON, OHIO, 100 tons, aeronautical building.

Western States

OAKLAND, CAL., 350 tons, municipal exposition building.

Canada

TORONTO, 1000 tons, addition to office building for Ontario Hydro-Electric Power Commission.



PIPE LINES

Stanolind Pipe Line Co., Tulsa, Okla., has placed 90 miles of 10¾-in. and 195 miles of 12¾-in. pipe, amounting to 32,000 tons, with four makers. The material is for immediate shipment, and distribution of the order is reported as follows: 90 miles 10¾-in. and 50 miles of 12¾-in. seamless pipe with the National Tube Co.; 42 miles 12¾-in. seamless with Youngstown Sheet & Tube Co.; 55 miles 12¾-in. electric welded with the A. O. Smith Corpn., and 48 miles 12¾-in. electric welded with the Republic Steel Corpn.

Lycoming Natural Gas Co., subsidiary of Standard Oil Co. of New Jersey, has placed orders for 10,000 tons of gas line, to be laid in New York State.

Standard Oil Co. of New Jersey has purchased 11,000 tons of 6⅝-in. gasoline line pipe, to be laid from Providence, R. I., to Worcester, Mass.

Maryland Counties Gas Co., Lexington Building, Baltimore, a subsidiary of Consolidated Gas, Electric Light & Power Co., same address, has secured permission to install natural gas pipe lines in different parts of Baltimore and Howard Counties. Gas will be secured from Maryland Gas Transmission Co., a subsidiary of Columbia Gas & Electric Corpn., 61 Broadway, New York, which will extend its pipe lines to a large area near Baltimore.

Kentucky Natural Gas Co., 423 West Third Street, Owensboro, Ky., an interest of Missouri-Kansas Pipe Line Co., 10 South La Salle Street, Chicago, has applied for permission to build a natural gas pipe line to point near city limits of Nashville, Tenn., where connection will be made with system of Nashville Gas & Heating Co.

Santa Anna Gas Co., Santa Anna, Tex., has begun construction of a local pipe line system for natural gas distribution, and has purchased a quantity of pipe from Continental Supply Co., 1501 Locust Street, St. Louis.

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Railroad Equipment

Thirteen railroad locomotives were shipped in August, comparing with a like number in July, according to reports to the Bureau of the Census from manufacturers. The August shipments comprised one electric locomotive and two steam locomotives for domestic account and 10 steam units for export. Shipments in the first eight months of 1931 totaled 127 locomotives, of which 95 were steam and 20 were electric for domestic use and 12 steam units were for export. Shipments in the first eight months of last year totaled 556 locomotives, comprising 522 steam and 15 electric for domestic use and 16 steam and three electric for foreign account. Unfilled orders at the end of August totaled 74 locomotives, 18 steam and 55 electric units being for domestic use and one steam locomotive for export.

Canadian Pacific has ordered two gas-electric rail motor cars from Ottawa Car Mfg. Co., Ottawa, Ont.

United States Navy has ordered a 30-ton flat car from Koppel Industrial Car & Equipment Co.

New York Central will order 2300 tons of steel for cars to be built in company shops.

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Reinforcing Steel

Inland Freight Terminal Will Require 5525 Tons

AWARDS of reinforcing steel the past week totaled 8350 tons, the largest tonnage for any week since July 23. Lettings included 2500 tons for the Chicago Post Office and 1200 tons for a mole at Los Angeles. Pending projects, at 8900 tons, were swelled by 5525 tons required for the Inland Freight Terminal in New York. A bridge for the Public Belt Railway, New Orleans, calls for 1500 tons. Awards follow:

STATE OF MASSACHUSETTS, 140 tons, road work, to Concrete Steel Co.

STATE OF MASSACHUSETTS, 120 tons, two bridges, to Kalman Steel Co.

STATE OF NEW YORK, 100 tons, small bridges in Peconic State Park, Putnam and Dutchess Counties, to Tidewater Structural Materials Corpn.

NEW YORK, 975 tons, retaining walls and bridges for Borough of Queens, to Concrete Steel Co.

EASTON, PA., 160 tons, building for Industrial Drinking Cup Co., to Kalman Steel Co.

CINCINNATI, 500 tons, Western Hill viaduct, to Pollak Steel Co.

DEARBORN, MICH., 280 tons, sewer, to Joseph T. Ryerson & Son, Inc.

ANN ARBOR, MICH., 430 tons, reservoir, to Truscon Steel Co.

CHICAGO, 2500 tons, Post Office, to Inland Steel Co.

PORT HURON, MICH., 260 tons, bridge, to Concrete Steel Co.

GRAND RAPIDS, MICH., 115 tons, sewer, to Kalman Steel Co.

PANAMA CANAL ZONE, 260 tons, miscellaneous work, to Bethlehem Steel Export Co.

MADISON, WIS., 115 tons, Forest Products research laboratory, to Truscon Steel Co.

STATE OF ILLINOIS, 100 tons, road work, to Concrete Engineering Co.

STATE OF ILLINOIS, 500 tons, road work, to various jobbers.

LOS ANGELES, 1200 tons, fish harbor mole, to Soule Steel Co.

TULARE COUNTY, CAL., 245 tons, State highway structures, to Truscon Steel Co.

LOS ANGELES COUNTY, CAL., 220 tons, San Gabriel and Rio Hondo flood control structures, to Los Angeles Iron & Steel Co.

GARFIELD COUNTY, COLO., 129 tons, State highway structures, to an unnamed bidder.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 5525 tons, foundations for Inland Freight Terminal, Eighth and Ninth Avenues, Fifteenth and Sixteenth Streets; Turner Construction Co., New York, low for general contract.

GREENBURG, N. Y., 300 tons, sewer construction for Westchester County Sanitary Commission; A. Gregoria, 1121 Neil Avenue, New York, low for general contract.

WILKES-BARRE, PA., 170 tons, branch house for Swift & Co.

WASHINGTON, 1200 tons, foundations for Department of Justice building; MacArthur Concrete Power Co., New York, low bidder on general contract.

FINDLAY, OHIO, 200 tons, sewage disposal plant.

NEW ORLEANS, 1500 tons, Public Belt Railway bridge across Mississippi River.

SEATTLE, 300 tons, Federal building.

TEHACHAPI, CAL., 100 tons, State correctional institution for women.

LOS ANGELES, 100 tons, garage and sales building for Montgomery Properties, Inc.

LOS ANGELES, 150 tons, apartment building on Rossmore Avenue.

SAN MATEO COUNTY, CAL., 542 tons, State highway structures.

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Cleveland Market

(*Concluded from page* 787)

accessories are ordering very little cold-rolled strip. Prices are firm at 1.55c, Pittsburgh, for wide and 1.65c for narrow hot-rolled strip and 2.15c, Cleveland, for cold-rolled strip.

OLD MATERIAL

Little scrap is being taken by Valley district mills, and locally the only mill that is accepting scrap is taking only blast furnace grades. Heavy breakable cast scrap has been sold as low as $7.50, delivered, to a Valley district consumer. Dealers are buying sheet clippings at $6 for Cleveland and $7 for Youngstown delivery. The market generally is weak, with prices untested.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$8.50 to	$9.00
No. 2 heavy melting steel	7.50 to	8.00
Compressed sheet steel	7.50 to	7.75
Light bundled sheet stampings	6.50 to	7.00
Drop forge flashings	6.75 to	7.00
Machine-shop turnings	5.00 to	5.50
Short shoveling turnings	6.50 to	7.00
No. 1 railroad wrought	9.50 to	10.00
No. 2 railroad wrought	10.00 to	10.50
No. 1 busheling	6.75 to	7.00
Pipes and flues	5.50 to	6.00
Steel axle turnings	7.50 to	8.00
Acid Open-Hearth Grades:		
Low phos., billet bloom and slab crops	14.00 to	14.50
Blast Furnace Grades:		
Cast iron borings	6.50 to	6.75
Mixed borings and short turnings	6.50 to	6.75
No. 2 busheling	6.00 to	6.25
Cupola Grades:		
No. 1 cast	10.00 to	10.50
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft	15.00 to	15.50
Miscellaneous:		
Rails for rolling	13.00 to	13.50
Railroad malleable	11.00 to	11.25

Market Analysis Is First Requisite in New Era of Selling

(*Concluded from page* 745)

the future trends and adopts its policies to promote increased consumption will inevitably outstrip those which are unable to recognize the change that confronts them, or which fail to place the proper valuation upon public opinion as the controlling factor in our industrial progress.

Technical research to develop new uses, new applications and new ideas has proved to be of great service, and will become even of greater service, in overcoming the problem of over-production. It represents the direct approach to the problem.

Technical research calls for a man of the creative type, a practical man of vision and imagination, experienced and able to understand and interpret sales possibilities. He should be free to travel, to contact with possible users and supplied with facilities and assistants to work out his ideas. He may develop many suggestions; most of them may prove to be impractical, but if one good one is located in a year's time the benefits would far offset the time and expense involved. Ideas that are patentable frequently follow as a result of research and with great rewards.

It is not infrequently the case that the small companies in an industry are more alert at discovering new outlets for their product than are the big, unwieldy corporations. We speak of research in a rather general way. But research may be just as successful in the market place as in the laboratory. Often the opportunities of research are lying beneath our noses unnoticed, and that is what makes business opportunities so plentiful and why it is always unwise to depreciate the efforts of even the smallest competitor. In cooperative effort we profit by bearing each other's burdens as well as in sharing each other's benefits.

Research Should Be Cooperative

When we suggest research for an industry we should not expect immediate results. It is no assured talisman, for results will depend upon how research is conducted. In order that it may be productive of good for the industry as a whole, it must be carried on by the industry and not left to a single company. In that case the industry will profit through impartial investigation while, when in the hands of a single corporation, the benefits must of necessity be selfishly applied and selfishly circumscribed. Research by joint action of an industry as a whole may reasonably be expected to promote the best interests of all—the industry as well as the public—and not that of a single company.

It is too bad that some money-making and money-saving methods are called "research." The word conjures up visions of high-brow investigations by expensive experts. Research has a scientific sound. An ordinary business man is scared by it; in fact, he may think research is theoretical and academic. He turns impatiently from it to his rule-of-thumb practices, which sometimes lead him to the bankruptcy courts.

It is often easier to sell a man a yacht, which will prove to be a big expense to him, than it is to sell him a profit-making idea of value to his business. We must never let up in our fight, because our industries will suffer by comparison if we do. We cannot lag behind in this fast modern pace. Research improperly applied may prove as great a waste as any that industry has ever experienced.

Some time ago a modern concern with a research laboratory decided that the use of a certain kind of fabric much stronger than that being used would improve the goods. But no mill would sell it. "It can't be made," they said. Here was a customer eager to spend creatively, but the sellers were years behind in research and had never dreamed of offering the kind of goods that were wanted.

But the buyer was ready for them. "We will send our experts into your factory and teach you how to make it," he said. Even then the mills balked, so now the buyer has organized his own mill. Sellers cannot stop the virile, up-to-date buyer when they are too backward to beat him to it by offering him what he wants, and when he wants it.

Resistance of Buildings to Wind Pressure

TWO pamphlets dealing with the subject of wind pressure on structures are Research Paper No. 301 of the United States Bureau of Standards, and Bulletin No. 31 of the engineering and science series of the Rensselaer Polytechnic Institute, Troy, N. Y.

The Bureau of Standards carried out tests in its wind tunnel on the distribution of wind pressure over a model of a mill building, similar in type to that used in the steel industry and many other metal-working activities. From the model test the conclusion was reached that the results are directly applicable to a full-scale building of the same shape. Tests were made with a plain roof of 20-deg. pitch, and also with a similar roof having a monitor ventilator at the ridge. It was found that wind loads on the roof of the monitor were greater than those on the roof of the main building. The pamphlet covers 21 pages and is well illustrated.

At the Polytechnic Institute, whose pamphlet of 53 pages is well illustrated also, the investigation was to determine the magnitude and distribution of wind pressures on a building of the type of an airship hangar. The conclusion reached is that the true distribution of wind pressures on structures is practically beyond the reach of theoretical analyses. The most important phenomenon observed in the test was the large negative pressures or vacua exerted upon buildings by wind. From this the recommendation is made that all covering material secured to a building, whether roof or walls, should be secured in place in such manner as to withstand an *outward* force as great as that of the highest wind to be expected.

German Mills Continue Dismissals and Belgian Wages Are Reduced

(*By Cable*)

LONDON, ENGLAND, Sept. 14.

THE new budget proposals are generally approved, despite recognition that industrial burdens will be increased. Special income tax relief for heavy industries, however, is expected to relieve the situation.

Reductions in unemployment payments are provoking vigorous opposition by labor. With the Government empowered to enact "orders in council" there is believed to be a possibility that tariffs will be introduced, if only as a temporary measure.

In Belgium, steel plants propose reducing wages 10 per cent, with half of the total reduction effective Nov. 1. Meanwhile, the Belgian steel industry is in a fairly good position, with output about 75 per cent of rated capacities.

The Gutehoffnungshütte in Germany is dismissing 440 rollers and further large scale dismissals are not unlikely as the company completes recent Soviet Union contracts.

German iron and steel stocks on producers' yards, Sept. 1, are estimated at 650,000 tons of pig iron, 350,000 tons of semi-finished material and 250,000 tons of finished products, mostly bars and shapes. The Wissen tin plate works in Germany has adopted a three-day week, affecting 2300 workers.

In Luxemburg only 24 furnaces are in blast and a 5 per cent reduction of wages in steel mills is being considered. Spanish shipyards have received orders for four oil tank ships.

Belgian steel mills to reduce wages 10 per cent, although operations are about 75 per cent of capacity.

* * *

German steel mill dismisses 440 rollers as orders for Soviet Union are completed.

* * *

Italy offers to exchange $20,000,000 of rails and rolling stock for Soviet timber and oil.

* * *

German copper smelters claim 35 per cent loss, and Government plans duty until foreign price is above 11c. a lb.

* * *

Empty shipping containers returned free under new tariffs of German railroads.

The Belgian - Luxemburg - French Pig Iron Entente has been renewed until March 31, next year, but the Société des Hauts Fourneaux de Saulnes of Longwy, France, is still an outsider.

Fourth quarter production of the Continental Wire Rod Cartel has been fixed at 360,000 tons.

British iron and steel business is quiet, but inquiries are increasing. Continental steel markets have weakened in the absence of a revival in demand. There is some export inquiry and small sales have been made to the Near East and to China, but mills are still able to quote immediate rolling in most cases.

British steel consumers are buying only for immediate needs. Tin plate business is quiet in the absence of any sizable orders, and sales have been made down to 12s. 9d. ($3.10) a base box, f.o.b. works port. Present tin plate output is at about 50 per cent of capacity, but this is expected to decline with more mills arranging to close.

General steel demand is adversely affected by the world economic situation, buyers awaiting definite evidence of improvement in business before covering future needs.

Some inquiry has appeared for galvanized sheets, but sellers are in most cases unable to accept the low offers made by buyers. Japan is inquiring for thin gage black sheets, but sales to this market have been negligible.

British production in August was 275,700 tons of pig iron and 375,300 tons of steel ingots. United Kingdom exports in August total 144,000 tons of iron and steel products, of which 11,000 tons was pig iron, 15 tons going to the United States.

British and Continental European Export Prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp with the £ at $4.8665 (par)

British Prices, f.o.b. United Kingdom Ports

Ferromanganese, export	£9	0s.				$43.74		
Billets, open-hearth	4	17½	to	£5	5s.	23.69	to	$25.52
Black sheets, Japanese specifications	9	10	to	9	15	46.17	to	47.39
Tin plate, per base box	0	12¾	to	0	13	3.10	to	3.16
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.71	to	1.81
Beams, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Channels, open-hearth	7	12½	to	8	2½	1.66	to	1.76
Angles, open-hearth	7	7½	to	7	17½	1.60	to	1.71
Black sheets, No. 24 gage	8	2½	to	8	7½	1.76	to	1.81
Galvanized sheets, No. 24 gage	8	15	to	8	17½	1.90	to	1.92

Continental Prices, f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	£2	6½s.	to	£2	7s.	$11.30	to	$11.42
Billets, Thomas	£2	16s.	to	£2	17s.	$13.61	to	$13.85
Wire rods, low C., No. 5 B.W.G.	4	15	to	5	0	23.09	to	24.30
Rails, light	6	0				29.20		
Black sheets, No. 31 gage, Japanese	11	5	to	12	12	54.68	to	58.32
						Cents a Lb.		
Steel bars, merchant	3	3	to	3	4	0.69	to	0.70
Beams, Thomas, British standard (nominal)	3	3	to	3	4	0.69	to	0.70
Channels, Thomas, American sections	5	12	to	5	14	1.24	to	1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	3	1½	to	3	2½	0.68	to	0.69
Angles, Thomas, 3-in.	3	3	to	3	4	0.69	to	0.70
Hoops and strip steel over 6-in. base	4	0	to	4	2½	0.90	to	0.92
Wire, plain, No. 8 gage	5	0	to	5	1¼	1.09	to	1.10
Wire, barbed, 4-pt. No. 12 B.W.G.	8	10				1.87		

Germany Considers Duty on Copper

HAMBURG, GERMANY, Sept. 2.—An import duty on copper is being considered, to be in effect as long as the foreign price is under 11c. a lb. The duty would be refunded to manufacturers of finished products for export. The German copper mines and smelters in the Hartz Mountain district report that at the present price level the loss is about 35 per cent on every ton of copper, and it will be necessary to entirely suspend operations by the end of September unless a duty or increased subsidy is granted. Suspension would affect about 13,000 workmen.

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Low Ocean Freight Rates From Europe Continued

HAMBURG, GERMANY, Sept. 2.—Concessions in ocean freight rates from Continental ports to South America continue, and the conference line ships have informed shippers that the present 10s. ($2.43) a ton rate on steel products to South America will be unaltered for the rest of this year. Continuation of these low rates will probably prove an obstacle for American exports to these markets.

The low ocean freights from the Continent to the Dutch East Indies, Japan and China, which were to terminate Sept. 30, have been extended to Nov. 30 to meet competition from a new shipping line not a member of the steamship conference. These rates are about $5 a ton to the Dutch East Indies and $3.80 to $4.50 a ton to Japan and China, depending upon the products shipped. When the charges for use of the Suez Canal are deducted from these rates little remains for the steamship companies.

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German Scrap Declines to New Low Level

HAMBURG, GERMANY, Sept. 2.—Steel scrap prices are said by consumers to be at the lowest level since Germany entered into open-hearth steel production. No. 1 heavy melting steel has recently been sold at 27.50 m. ($6.50) a metric ton, delivered to consumers in the Rhineland and Westphalia.

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Japan's Pig Iron Stocks Increase

YOKOHAMA, JAPAN, Aug. 12.—Statistics gathered by the Mitsubishi Trading Co. show that on July 1 stocks of pig iron in Japan totaled 509,195 tons, an increase of 5301 tons from the June 1 total. Of this total, 616 tons was of American origin and 11,146 tons was from Indian furnaces.

Soviet Adheres to Trade with Own Customers

HAMBURG, GERMANY, Sept. 2.—With the Soviet Union adhering firmly to its announced policy of buying only from countries which purchase Soviet products, Russian trade is being concentrated in certain nations. German steel mills are accepting manganese ores as part payment for large steel orders placed with them, and recently Italian industry has offered to buy Soviet oil, gasoline and timber against delivery of Italian railroad materials and rolling stock to the extent of about $20,000,000.

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Germans Use Containers for Export Shipments

HAMBURG, GERMANY, Sept. 2.—A special export tariff on container shipments from German manufacturing plants to ports has been published by the railroads as a means of stimulating shipments of hardware, iron, steel and non-ferrous metals in containers. Under the new tariff, empty containers will be returned to the manufacturers from the ports without charge, and the rate on the filled containers will be lowered. This is expected to be of special advantage to the machinery and hollow-ware industries, which have been making increased use of containers. Recently machines to Japan have been packed in special containers.

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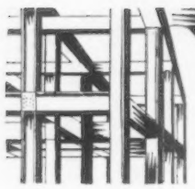
▲ ▲ ▲ Egypt joins with other Eastern nations in progressively modernizing ancient cities with the aid of steel. Cairo has embarked on a program of widening streets and improving transportation facilities. The grooved rails in the foreground came from an American mill. ▲ ▲ ▲



PLANT EXPANSION AND EQUIPMENT BUYING

Some Signs of Pick-up in Machine Tool Buying

Orders and Inquiries at Cleveland More Plentiful—Elsewhere There Is Not Much Change

THE recent flurry of machine tool buying by automobile companies has been followed by some further signs of activity in the Detroit-Cleveland territory, but elsewhere the situation is as dull as it has been all summer.

At Cleveland there has been a slight gain in orders from makers of automobile parts, radio parts and specialties. Automatic screw machinery has become more active. The expected use of wide sheets by automobile manufacturers probably will require new press equipment capable of forming the larger sections, and some welding work will be eliminated.

The automobile industry, including the makers of parts and accessories, is considered the most likely source of new machine tool buying in the near future. Changes in automobile models will necessitate the purchase of some new production equipment.

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NEW YORK

The past week has been featureless in machine tool business. Orders have been for single machines, and there have been very few of these. Local machine tool dealers are still awaiting orders from the Board of Transportation, New York, and the Brooklyn Navy Yard. No other buying of importance is in sight.

MILWAUKEE

Developments the past week seem to confirm the hopes of machine tool builders that improvement in the situation is setting in. It was one of the best weeks in at least three months in both orders and inquiries. Automotive industries appear to be especially interested, although numerous other lines of metal-working are represented in requests for information relative to prospective purchases. The local employment curve is rising in an encouraging way. On the whole, the picture is less drab than it has been in a long time.

CLEVELAND

Evidences of a pick-up in the machine tool market in this territory appeared the past week. A slight gain in single tool orders is reported by some manufacturers and dealers from makers of automobile parts, radio parts and specialties. With others business in no better than it has been. Automatic screw machinery is a line that has become more active. In addition to some scattering domestic orders, a Cleveland maker took export orders for five machines. Activity in presses is confined to an occasional single replacement machine. In the automotive industry it is reported there is a tendency to use wider sheets more generally for automobile bodies, thus reducing the number of pieces and the amount of welding. This is expected to necessitate the purchase in the Detroit territory of some new press equipment capable of forming the larger sections.

Bids are being taken this week by the Air Corps, War Department, Wright Field, Dayton, Ohio, for two 20-in. motor-driven lathes, a 30-in. knife grinding machine and five bench precision lathes for Wright Field.

CINCINNATI

With several plants closed during the week of Labor Day, the machine tool market in this district was quieter than in the preceding week. New bookings were small in number and represented urgent needs of users. Inquiries are scarce.

NEW ENGLAND

Machine tool buying is of small proportions and widely scattered. New inquiries are practically nil, and old ones apparently are no nearer closing than they were a month ago. The Navy Department is asking bids on a sizable radial drill for the Charlestown (Boston) Navy Yard.

CHICAGO

The machine tool market in the first 10 days of the month has not changed materially from August, although a few dealers report a slight gain in inquiry. However, most of this business involves only single tools, and used or rebuilt equipment is nearly always a factor. Orders are slow in being placed and show no improvement over the preceding month in total volume.

The inquiry of the Illinois Iron & Bolt Co., Carpentersville, Ill., for four or five tools is still pending; the company is said to have purchased a used grinder. No other lists of even this size are before the trade and the report that the Bendix Corpn., South Bend, Ind., might soon be in the market for tools cannot be confirmed. Most dealers consider makers of automobiles, parts and accessories as the most likely potential buyers of tools.

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New York

BIDS have been asked by Port of New York Authority, 80 Eighth Avenue, New York, for superstructure for 15-story freight terminal on block bounded by Eighth and Ninth Avenues, Fifteenth and Sixteenth Streets. Installation will include elevating, conveying, loading and other equipment. Building will cost over $8,000,000, exclusive of equipment, and about $16,000,000 complete.

Rainbow Light, Inc., 21-43 Forty-fourth Road, Long Island City, manufacturer of electric luminous signs, lighting tubes, etc., has leased one-story building at 1139-41 Fifteenth Avenue for expansion.

New York & Queens Electric Light & Power Co., 28-19 Bridge Plaza, Long Island City, plans a one-story equipment storage and distributing plant to cost about $45,000 with equipment.

Westover-Wolfe, Inc., Albany, N. Y., recently organized by Wendell Westover, 91 State Street, and Oliver M. Wolfe,

A ROPE
that won't "call quits"

IT IS *endurance*—the ability to stand up under punishing service—that *keeps* wire rope on the job. Stamina it's called. ¶ Stamina such as found in Roebling "Blue Center" Steel Wire Rope doesn't "just happen" It is skilfully, painstakingly worked into wire, strand and finished rope throughout every production process from melting the steel to closing the strands. ¶ If the rope you need must "take it on the jaw" without calling quits—Roebling "Blue Center" will exactly meet your requirements. A rope of superlative quality—it assures the utmost of durability, safety, economy.

JOHN A. ROEBLING'S SONS CO., TRENTON, N. J.
Branches in Principal Cities *Export Dept.: New York, N. Y.*

ROEBLING "BLUE CENTER" STEEL **WIRE ROPE**

Wire · Wire Rope · Copper & Insulated Wires & Cables

Welding Wire · Flat Wire · Wire Cloth & Wire Netting

same address, with capital of $50,000 and 300 shares of common stock, no par value, plans operation of local factory for manufacture of heat regulating devices and kindred equipment.

Fred Goat Co., Inc., 314 Dean Street, Brooklyn, manufacturer of machinery and parts, has leased space at Dean Street and Third Avenue for expansion.

American Can Co., 230 Park Avenue, New York, is carrying out expansion at branch plant at Savannah, Ga., with installation of additional equipment; a larger working force is being employed. Company has contracted with General Foods Corpn. to furnish over 1,000,000 special vacuum cans a month for coffee packing.

Regent Plumbers Supply Co., 1353 Third Avenue, New York, plumbing equipment, pipe, supplies, etc., has leased three-story building, 21 x 102 ft., for new storage and distributing plant, with pipe shop and other departments.

Schreiber & Goldberg, Inc., New York, has been organized to take over and expand company heretofore operated as Schreiber & Goldberg, 37 East Eighth Street, manufacturer of pressing machines, parts, etc. New company will manufacture other iron and metal goods. It is headed by Joseph Schreiber and David Goldberg.

Department of Plant and Structures, Municipal Building, New York, plans to place contracts for work and equipment on Tri-Borough Bridge, totaling $2,450,000 before close of year, of which over $2,000,000 will be used for steel purchases. Edward A. Byrne is chief engineer of department.

Standard Engineering Products, Inc., 144 Bleecker Street, Newark, N. J., manufacturer of air-conditioning equipment, slicing machines, bakery equipment, etc., a subsidiary of Booth Engineering Co., Ltd., Los Angeles, has leased two floors in building at Dickerson and Duryee Streets for new plant. Option has been taken to lease two additional floors on or before Jan. 1. Present works will be removed to new location.

Board of Education, West Orange, N. J., plans installation of manual training equipment in new three-story and basement junior high school, for which revised plans are being drawn by Hacker & Hacker, 201 Main Street, Fort Lee, N. J., architects, to cost over $400,000. It is expected to ask bids on general contract early in October.

Jersey Central Power & Light Co., Asbury Park, N. J., has arranged for a preferred stock issue of $6,000,000, part of fund to be used for extensions and improvements in plants and system.

Bergen Automobile Co., 17 Banta Place, Hackensack, N. J., local representative for Buick automobile, has plans for a two-story and basement service, repair and garage building to cost about $125,000 with equipment. Arthur Dore, Main and Essex Streets, is architect.

Staub Engineering Co., Newark, recently organized by Burnett A. Reeves, 72 Elm Avenue, Rahway, N. J., and Percival H. Staub, Jersey City, N. J., plans operation of factory for manufacture of special coal and oil machinery and parts. Company is represented by Arthur A. Melnik, 207 Market Street, Newark, attorney.

Perryman Electric Co., 4895 Boulevard, North Bergen, N. J., manufacturer of radio tubes, will develop increased capacity at plant and make additions to working force. Company has secured contract for 350,000 vacuum tubes from a radio equipment company, in addition to another recent order for 104,000 tubes from same concern.

New England

PLANS are under way by Strathmore Paper Co., Mittineague, West Springfield, Mass., for a two-story addition to cost close to $55,000 with equipment. L. Howes, chief engineer, is in charge.

Arrow-Hart & Hegeman Electric Co., Hawthorn Street, Hartford, Conn., manufacturer of electrical supplies, has awarded general contract to A. F. Peaslee, Inc., 15 Lewis Street, for a one-story addition, 36 x 70 ft., to cost close to $35,000 with equipment. Mylchreest & Reynolds, 238 Palm Street, are architects and engineers.

Main Coal & Dock Co., Bucksport, Me., plans rebuilding part of storage and distributing plant recently destroyed by fire, with loss over $200,000 including coal conveyors, cranes and other handling and loading equipment.

Automatic Regulator & Valve Corpn., Boston, care of Cameron Macleod, Berwyn, Pa., treasurer, recently organized by Mr. Macleod and associates with capital of $594,000, plans operation of plant near Boston for manufacture of temperature regulating instruments and devices. Hebert A. Stebbins, 12-A Parkway Crescent, Milton, Mass., will be president.

School Committee, Everett, Mass., plans installation of manual training equipment in connection with extensions and improvements in Albert N. Parlin Junior High School, including metal-working, woodworking, printing, electrical and other shops; entire program will cost over $200,000. Desmond & Lord, 1 Beacon Street, Boston, are architects.

Northern Gas Utilities Co., Inc., 15 Congress Street, Boston, has plans for an artificial gas plant at Provincetown, Mass., to cost over $80,000 with equip-

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RUSTLESS STEEL USED IN MODERN FURNITURE

ROUND tubing, which is so widely used in modern metal furniture, has been departed from in the high chrome-nickel alloy steel desk and side chair shown in the illustration. These two pieces, together with the arm chair, were designed for an office in the Empire State Building, NewYork. The alloy, Allegheny metal, was furnished by the Allegheny Steel Co., Brackenridge, Pa. The frame of the maple veneer desk with black glass top is of chrome-nickel steel strapping 2 in. wide and ¼ in. in thickness. The upholstered side chair has the same strapping in its frame, but the arm chair of the group has nickel-plated square steel tubing for the arms and legs.

and

discuss

"STABLE-ARC"

"It seems to me that all welders have a stable arc, according to the advertising I read."

"There's only one 'Stable-Arc,' that's Lincoln's."

"Can you prove that to me?"

"You can prove it yourself by asking those who own Lincoln welders and other makes, which make of welder they prefer and why."

"Evidently the answer to that would explain why I see more Lincoln 'Stable-Arcs' in use than any other make."

"Not entirely—the Lincoln 'Stable-Arc' welder also has dual control of welding heat . . . a separately excited generator field . . . sparkless commutation . . . simplified and unified control, right up where it's handy . . . and all steel construction. No other welder has all these features. There's only one name for this unbeatable combination of features in a welder—and that's

LINCOLN

THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

W-188

ment. G. H. Stevens, 141 Milk Street, Boston, is engineer.

Boston Elevated Railway, 31 St. James Avenue, Boston, will install a new motor bus repair shop, with capacity for handling five buses at one time, in connection with a one-story addition to bus service and garage building at car barn at Medford, Mass. Oil storage and distributing facilities will also be installed. Program will cost over $75,000. A. J. Blackburn is company architect, address noted.

Nicholson Co., Chrysler Building, New York, has been awarded general contract for coal pockets to be built by Burns Brothers, 185 Summer Street, Boston.

Bids will be opened Oct. 14 for ventilating fans and motors required for East Boston, Mass., traffic tunnel.

Hamilton Standard Propeller Corpn., a subsidiary of United Aircraft & Transport Corpn., will be transferred from West Homestead, Pa., to East Hartford, Conn., on Oct. 1, and will occupy space in Pratt & Whitney Aircraft Co. plant.

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Philadelphia

FOUR-STORY building at 534-36 North Third Street, Philadelphia, on site 34 x 108 ft., has been purchased by Schuch Machine Co., 235 New Street, manufacturer of general machinery and parts, for expansion.

Department of Public Safety, City Hall, Philadelphia, Lemuel B. Schofield, director, is asking bids until Sept. 24 for furnishing and mounting 250 more or less street name signs, with 125 more or less iron posts and brackets. Specifications at Bureau of Maintenance and Repairs, 1117 Reed Street.

Bureau of Supplies and Accounts, Navy Department, Philadelphia, and Washington, is asking bids until Sept. 22 for a gasoline electric locomotive for Philadelphia yard; also steel filing cabinets, radio generators, etc., for same yard.

Howard A. Lang, 364 West Duval Street, Philadelphia, and associates have organized American Control Corpn., to operate local plant for manufacture of automatic control devices and equipment for electrical service, switches, etc. Raymond Fischer, 816 Mason Avenue, Drexel Hill, Pa., is interested in company.

Philadelphia Coke Co., 4501 Richmond Street, Philadelphia, has filed plans for alterations and improvements in coke-screening plant, including installation of additional equipment.

Kuhn & Jacob, Prospect Street, Trenton N. J., operating a general machine works, have plans for a one-story machine shop, 40 x 175 ft., on site, 256 x 300 ft., recently acquired, to cost $25,000.

Bowers Battery Mfg. Co., Inc., Fleetwood, Pa., has been formed with a capital of $25,000 to take over and expand local company of same name, now occupying plant previously used by Fleetwood Body Co., manufacturer of automobile bodies. New company will be headed by Clarence P. Bowers, 34 South Fifth Street, Reading, Pa., and Charles F. Knoll, 116 Washington Street, N. E., Fleetwood, and will specialize in production of electric battery parts and assembling. Mr. Knoll will be treasurer.

Board of Education, East Stroudsburg, Pa., contemplates installation of manual training equipment in new two-story and basement junior high school, for which plans are being drawn by Lacey & Rinker, Henry Building, architects, to cost about $175,000.

John H. Herbein, 624 North Twenty-fifth Street, Pennside (Berks County), Pa., and associates have organized Modern Iron Works with capital of $25,000, to operate a general iron and metal works at Reading, Pa., including ornamental iron, brass and bronze department. John Bauman, Shillington, Pa., will be an official of company.

Board of Education, Pottstown, Pa., has asked bids on general contract for a new power house and other improvements at Hill school, to cost over $75,000. Ballinger Co., Twelfth and Chestnut Streets, Philadelphia, is architect and engineer.

Dictatype, Inc., Sixteenth and Claymont Streets, Wilmington, Del., manufacturer of precision machines, etc., has resumed operations after a shut-down for past three months.

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South Atlantic

PLANS are being drawn by Michael Heister, 2008 Klingle Road, Washington, for a multi-story automobile service, repair and garage building, 100 x 150 ft., at Baltimore, to cost over $250,000 with equipment.

Flashlight Corpn. of Virginia, Inc., Martinsville, Va., recently organized by C. B. Collins, Washington, and associates, has acquired about 75 acres on Daniel's Creek, near Martinsville, as site for new plant for manufacture of flashlights, to operate without batteries. Plans are under way for initial unit, one story, 30 x 200 ft., for production of parts and assembling, to cost over $30,000 with equipment.

Greensboro Coca-Cola Bottling Co., Greensboro, N. C., recently organized by J. Frank Harrison, Chattanooga, Tenn., and associates, plans installation of automatic bottling machinery, conveying and other handling equipment in new two-story plant to cost over $85,000, of which about $25,000 will be used for equipment.

United States Engineer Office, Norfolk, Va., will receive bids until Sept. 29 for constructing and delivering one steel barge at local yard.

Tips, Inc., Baltimore, care of Emory H. Niles, Munsey Building, attorney and representative, recently organized by local interests with capital of $50,000 and 1000 shares of common stock, no par value, plans operation of local plant for cutting, welding, brazing and kindred mechanical equipment.

Division of Purchases and Sales, Department of Commerce, Washington, will receive bids until Sept. 24 for quantity of steel tape armored cable.

Board of Trustees, National Training School for Boys, Bladensburg Road, N.E., Washington, has awarded general contract to Bahen & Wright, 916 Rhode Island Avenue, N. E., for one and two-story addition for vocational training unit, 40 x 122 ft., to cost over $100,000 with equipment.

International Vegetable Oil Co., Milton Street and West Point Railroad, Atlanta, Ga., is planning to rebuild part of compounding and distributing plant recently destroyed by fire, with loss of more than $100,000 including machinery.

Constructing Quartermaster, Langley Field, near Monroe, Va., is asking bids until Oct. 5 for a gasoline fueling station at local field, for which a fund of about $20,000 is available.

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Buffalo

CONTRACT has been let by Niagara Hudson Power Corpn., Buffalo, to Dawson Brothers, Union Building, Syracuse, N. Y., for a three-story equipment, service and garage building, 103 x 225 ft., at Syracuse, to cost about $200,000 with equipment.

Claude H. Naber, Hamburg, N. Y., and associates have organized N. & H. Spreaders, Inc., with capital of $20,000 to operate a local plant for manufacture of machinery and parts. Walter D. Wightman, Hamburg, and Clarence Holliday, 823 Myrtle Avenue, Albany, N. Y., are interested in new company, which will be represented by William J. Magavern, Erie County Bank Building, Buffalo.

Eastman Kodak Co., Kodak Park, Rochester, N. Y., plans rebuilding part of four-story roll-coating plant unit in film division, recently destroyed by fire, with loss more than $75,000 including equipment.

Curtiss Aeroplane & Motor Co., Kenmore Avenue, Buffalo, has secured contract from United States Army for 46 pursuit planes, with spare parts, at price of $704,629.33, and will carry out production at local plant. Contract for 92 aircraft engines, each with rating of 700 hp., has been placed with Wright Aeronautical Corpn., Paterson, N. J., an affiliated organization, at price of $726,540. Engine units will be used for Curtiss planes with spare engine for each plane.

Oneida Community, Ltd., Oneida, N. Y., manufacturer of silverware, animal traps, etc., is advancing operations and has placed flatware plant at Sherrill, N. Y., on full time schedule, with branch flatware plant at Niagara Falls, Ont., on a similar basis.

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Cleveland

BIDS have been asked on general contract by Patterson Foundry & Machine Co., East Liverpool, Ohio, for a one-story steam-operated electric generating plant to cost about $75,000 with machinery. Albert D. Birch, plant manager, is in charge.

Sandusky Plating Works, Inc., Sandusky, Ohio, care of Alvin F. Weichel, Feick Building, recently organized by B. B. and G. H. Heiler, Sandusky, plans operation of local metal plating works. Norbert Keeley, Sandusky, is interested in new company.

John P. Cochran Co., Wynnewood Road, Cleveland, manufacturer of paints, varnish, etc., has leased building at 917 Manchester Avenue, Pittsburgh, for a new factory branch, storage and distributing plant.

Board of Water Commissioners, Youngstown, Ohio, William D. Cregan, head, has plans for two steel standpipes with capacity of 1,500,000 gal., and tank unit, with rating of 500,000 gal., for which fund of $200,000 has been authorized, for water supply system in Fairlawn district. George Turner is city engineer.

Wellman Engineering Co., 7000 Central Avenue, Cleveland, has secured contract

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from Navy Department, Washington, for steel mooring mast for new dirigible base at Sunnyvale, Cal., at price of $119,000. Unit will be of type to move on standard railroad tracks.

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Milwaukee

PLANS are being made by White House Milk Co., Inc., 1800 South Twenty-first Street, Manitowoc, Wis., for a tin-plate container manufacturing plant, first unit of which will cost $200,000, either at Manitowoc or at West Bend, Wis. Decision as to site will be made by Jan. 1. H. M. Clark is president and general manager.

Common Council, Watertown, Wis., is taking bids until Sept. 21 for sewage plant for city to replace present system condemned by State board of health. Council has authorized erection of new plant at cost of about $110,000, including sewage treatment system. B. F. King is city engineer.

Neenah Brass Works, Neenah, Wis., has acquired machinery, equipment and good will of Johnson & Wells Machine Co., Neenah, and is consolidating operations at its plant on Edna Avenue. Otto Johnson and Fred Wells, partners in machine company for 20 years, have joined Brass Works staff.

Common Council, Wisconsin Rapids, Wis., has instructed C. P. Cross, city engineer, to advertise for estimates of cost of building complete new electric light and power plant.

Appleton Engraving Co., 348 West Water Street, Appleton, Wis., has engaged LeVee & Gmeiner, architects, Appleton, to design a new branch plant in Menasha, Wis., 65 x 115 ft., part two stories and basement.

Wisconsin Distributing Co., 701 South Main Street, Oshkosh, Wis., has engaged D. E. Anderson, architect, Marquette, Mich., to design new cold storage warehouse, 46 x 100 ft., two stories and basement, to cost about $50,000 complete.

Village Board of Gresham, Wis., has placed contract for a new municipal hydroelectric power house with Ford Construction Co., 911 South Jackson Street, Janesville, Wis. Total cost of project is about $40,000.

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Cincinnati

CONTRACT has been let by Bode Bodies, Inc., 1655 Central Avenue, Cincinnati, manufacturer of automobile bodies, to William Miller & Son, 1950 Central Parkway, for one-story addition, 25 x 60 ft.

State Department of Public Welfare, Columbus, Ohio, John McSweeney, director, has plans for an electric light and power plant at Ohio State Penitentiary, to cost $296,000. Installation will include a 300-kw. generator, condenser, two 2500-hp. boilers, with forced draft and induced draft fans, stokers and accessories, water-softening plant, boiler feed pumps and other pumping units, etc. John Youngblood is consulting engineer for department.

Contracting Officer, Wright Field, Dayton, Ohio, will receive bids until Sept. 22 for 100 mount assembly guns, quantity of brackets, spacers, fittings, etc., and 600 to 1100 clocks, aircraft type.

Television & Radio Corpn. of Ohio, Columbus, Ohio, care of Ballard, Jones & Hansel, 8 East Broad Street, representatives, recently organized by J. W. Tracy, Columbus, and associates, plans operation of local plant for production of radio and television equipment.

Anglin Tobacco Warehouse Co., 135 North Lime Street, Lexington, Ky., has awarded general contract to Greer & Williams, Lexington, for one-story addition to drying, storage and distributing plant, 110 x 450 ft., to cost close to $100,000 with equipment.

Kentucky & West Virginia Power Co., Ashland, Ky., has awarded general contract to Walter H. Cox, Ashland, for new equipment storage and distributing plant, with service and repair departments, to cost close to $70,000 with equipment.

William G. Rehn & Sons, 454 Bank Street, Cincinnati, meat packers, have awarded general contract to Meyer-Hecht Co., 2824 Stanton Avenue, for one- and two-story and basement addition, to cost over $60,000 with equipment. Owner will place orders for mechanical-handling equipment, including trucks, carriers, etc., also for refrigerating machinery, water cooling tower and other equipment. John J. Wilkens, 1107 Bates Avenue, is architect.

Crosley Radio Corpn., 1329 Arlington Street, Cincinnati, is arranging for production of new specialties to supplement radio equipment manufacturing division. A line of electric irons recently has been developed and marketing will soon begin of a domestic furnace stoker, entirely automatic. Company is also experimenting with additional allied products.

Ford Motor Co., Hamilton, Ohio, is resuming production at local branch plant and has recalled about 200 men for department devoted to radius rods for trucks, running boards, etc.

Dayton Rubber Mfg. Co., Dayton, Ohio, recently erected a building 160 ft. x 180 ft., costing about $30,000, for additional warehousing and shipping facilities.

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Pittsburgh

PLANS are under way by Mayer China Co., Second Avenue and Fourth Street, Beaver Falls, Pa., for rebuilding power plant and mold shop, recently destroyed by fire, with loss over $100,000 including equipment. New units will cost about a like sum.

William Baehr Motors, Inc., Pittsburgh, local representative for Studebaker automobiles, has leased four-story building heretofore occupied by R. E. Loughney Motors Co., for a new service, repair and sales building. Loughney company has leased building at 5940-46 Baum Boulevard, for a new service, repair and sales station.

Duncan Macdonald, Blairsville, Pa., care of Blairsville Chamber of Commerce, has purchased property for new plant for production of steam power units for motor coaches, large motor vans and kindred trucks, including parts and assembling departments. A company will be organized to carry out project, in which Chamber of Commerce is interested. Later facilities will be arranged for manufacture of steam-propelled pleasure automobiles.

Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, is planning to rebuild factory branch, storage and distributing plant at Tacoma, Wash., recently damaged by fire, with loss reported over $75,000 including equipment. Temporary quarters have been located at 1721 Jefferson Avenue, Tacoma; C. D. McColm is local manager.

Cooper-Bessemer Corpn., Grove City, Pa., manufacturer of Diesel engines, gas engines, parts, etc., is arranging for consolidation of all foundry operations, including pattern-making, etc., at local plant, with concentration of engine production, including assembling and finishing, at plant at Mount Vernon, Ohio. Other work of engineering division will also be located at last noted plant.

M. W. McClane, receiver for Sidway-Topliff Co., Washington, Pa., manufacturer of children's vehicles, parts, etc., is arranging for resumption of production at plant, following a shut-down of more than a year.

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Gulf States

PLANS are being considered by Humble Oil & Refining Co., Houston, Tex., for a new oil refinery near Kilgore, Tex., to use crude oil from east Texas oilfields, to cost about $300,000 with equipment. Unit will be operated in conjunction with contemplated refinery near Gladewater, Tex., to cost about $200,000, previously reported.

United States Engineers' Office, Vicksburg, Miss., will receive bids until Oct. 2 for one twin screw Diesel dredge tender, 51 ft. long, 14 ft. wide, and 4.6 ft. deep, equipped with two Diesel engines, each of 70-hp. capacity and auxiliary equipment.

Florida Petroleum & Refining Co., Stovall Professional Building, Tampa, Fla., has taken option on 15 acres of waterfront property, and contemplates using site for a new oil refinery, to cost over $200,000 with machinery and storage and distributing facilities. It is proposed to use crude oil from Oklahoma, transporting to refinery by fleet of barges.

In connection with two new hangars to cost about $250,000, on which superstructure will soon begin, Construction Quartermaster, Army Air Corps., Duncan Field, near San Antonio, Tex., plans early erection of new machine and repair shops, to cost close to $500,000 with equipment. Lieut. Col. A. W. Robbins is commanding officer at air corps depot.

Kimball Milling Co., Fort Worth, Tex., Kay Kimball, president, has awarded general contract to Jones-Hettelsater Construction Co., Mutual Building, Kansas City, Mo., for new grain elevator at plant of Diamond Mill & Elevator Co., Sherman, Tex., recently acquired, to cost over $90,000 with elevating, conveying, screening and other equipment.

Lone Star Gas Co., Dallas, Tex., operating oil and natural gas properties, is negotiating for purchase of Texas Pacific Coal & Oil Co., Fort Worth, Tex., operating oil refineries, storage and distributing plants, with a pipe line subsidiary known as Thurber Pipe Line Co., Thurber, Tex. Purchasing company will consolidate properties with other interests and proposes expansion in west Texas district where Texas Pacific company has bulk of holdings, including developments in oil refineries and pipe line facilities.

Phoenix Refining Co., Pettus, Tex., will carry out expansion and improvements at local oil refinery for increase of about 40 per cent in present output. Storage

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and distributing facilities will also be enlarged. Program will cost over $75,000 including equipment.

Texas Co., Texas Building, Houston, Tex., will begin extensions and improvements in pumping station at Sour Lake, Tex., for oil pipe line service, to include installation of two new 250-hp. crude oil engines and auxiliary equipment, to cost about $70,000.

City Council, Plainview, Tex., contemplates an appropriation of about $100,000 for a municipal electric light and power plant.

Texas Power & Light Co., Dallas, Tex., has work under way on a new high-tension power line from generating plant at Trinidad to Arp., Tex., and vicinity, about 75 miles, for power service in east Texas oilfield district, to cost over $85,000 with switching and substation facilities.

R. E. Ewing, Santa Rosa, Tex., is at head of project to erect an ice-manufacturing plant at Edcouch, Tex., to be electrically-operated and to cost about $75,000 with machinery. Company will be organized to carry out project.

East Jefferson Water Works District No. 1, Metairie, La., contemplates installation of pumping machinery and other power equipment, pipe lines, etc., in connection with expansion and improvements to cost $300,000. An election has been called on Sept. 22 to vote bonds in amount noted.

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Chicago

PLANS have been filed by Illinois Steel Warehouse Co., 1319 Wabansia Avenue, Chicago, for one-story storage and distributing plant, 75 x 402 ft., to cost over $40,000 with equipment. Leonard C. B. Holmboe, South Chicago, is architect.

Board of Education, City Hall, Minneapolis, George E. Womrath, business superintendent, has asked bids on general contract for first unit of a new vocational school group, three stories and basement, to cost $400,000 with equipment. Bureau of Buildings, Architectural Division, 811 N. E. Broadway, is architect.

Common Council, Lenox, Iowa, L. B. Carruthers, city clerk, is asking bids until Sept. 22 for a municipal electric light and power plant.

Heinlin-Hine Mfg. Co., Burlington, Iowa, manufacturer of passenger and freight elevators, parts, etc., has leased a one-story building, 50 x 80 ft., to be erected by Oscar Weinrich, Burlington, and associates, for new plant unit.

Union Station, Canal, Adams and Jackson Streets, Chicago, has asked bids on general contract for a central steam power plant for service at Union Station, new Post Office, buildings of Pennsylvania Railroad and other neighboring structures, to cost about $2,000,000 with equipment. New plant will replace present power station on site of new Post Office, which will be dismantled.

Double Rainbow Mines Co., Galena, S. D., has approved plans for a new ore mill at mining properties, to cost over $50,000 with grinding, pulverizing, conveying and other equipment.

Board of Education, Charles City, Iowa, plans installation of manual training equipment in new three-story and basement high school to cost about $325,000, for which bids will soon be asked on general contract. Jacobson & Jacobson, Wesley Temple Building, Minneapolis, are architects; Frank Tustison Co., last-noted address, is mechanical engineer.

Town Council, Walnut, Iowa, is asking bids until Oct. 6 for extensions and improvements in municipal electric light and power plant, including additional equipment.

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St. Louis

CONTRACT has been let by Pittsburgh Erie Saw Co., 704 South Fourth Street, St. Louis, manufacturer of saws and kindred equipment, to William H. & Nelson Cunliff Co., 3327 Lindell Street, for new two-story plant, 45 x 210 ft., to cost over $50,000 with equipment.

City Council, Sullivan, Mo., has been authorized to arrange bond issue of $80,000 for a municipal electric light and power plant, for which plans will be drawn soon.

Stuttgart Rice Growers Elevator Co., Stuttgart, Ark., recently organized, will begin superstructure for a new rice elevator on local site, to cost over $70,000 with elevating, conveying, screening and other equipment. G. E. Hammans is president.

Royal Palm Dehydrating Co., Pawhuska, Okla., is planning new two-story dehydrating plant, 90 x 170 ft., near Oklahoma City, to cost over $50,000 with equipment.

Community Ice & Produce Co., Sulphur Springs, Tex., is considering a new ice-manufacturing and cold storage plant with electric-operated machinery at Muskogee, Okla., to cost close to $50,000 with equipment.

Board of Public Works, Kansas City, Mo., has awarded general contract to McCandless Building Co., Victor Building, for new group of buildings at municipal airport, including hangar, 120 x 400 ft., with repair shop to occupy portion of 50 x 400 ft. leanto; one-story motor and plane testing building, 40 x 120 ft. and office unit, 40 x 170 ft., to cost about $250,000 with equipment. Alonzo H. Gentry, Inc., 109 West Eleventh Street, is architect.

Construction Quartermaster, Fort Riley, Kan., is asking bids until Sept. 21 for one-story hangar, 120 x 243 ft., with two extensions, 22 x 40 ft., for shop and service purposes, and one-story boiler house, 21 x 44 ft., to cost about $85,000.

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Indiana

CONTRACT has been let by Board of Directors, University of Notre Dame, South Bend, to Thomas L. Hickey, 121 North Hill Street, for an addition to university power plant, to cost over $75,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Eli Lilly & Co., Alabama and McCarty Streets, Indianapolis, manufacturers of chemical and allied specialties, have awarded general contract to Leslie Colvin, Continental Bank Building, for a new plant and research laboratory unit, four stories and basement, 50 x 222 ft., to cost over $500,000 with equipment. Robert F. Daggett, Continental Bank Building, is architect.

Officials of Bendix Corpn., South Bend, manufacturer of automobile and aircraft equipment, instruments, etc., and Standard Oil Co. of Indiana, 910 South Michigan Avenue, Chicago, associated, have organized Lubrication Corpn., with capital of $200,000, to establish plant for manufacture of grease fittings and equipment for automotive and industrial machinery, grease and oil-dispensing equipment, etc., also lubricants, oils, greases, and allied specialties. R. P. Lansing will be president; J. A. Watson, secretary, and A. Y. Dodge, general manager. Mr. Lansing is now vice-president of Bendix Research Corpn.

Board of Education, Gary, plans installation of a vocational training department in first unit of new high school group, now under way, three stories and basement, 187 x 295 ft., to cost close to $1,000,000 with equipment. William B. Ittner, 911 Locust Street, St. Louis, is architect.

Spencer-Cardinal Furniture Corpn., Marion, has adopted a night shift in addition to regular day force for production of radio cabinets, and is now giving employment to about 400 persons. Branch factory of company at Wabash is also developing an increased schedule, with working force of about 200 people.

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Detroit

PLANS are under way by Ford Motor Co., Dearborn, Mich., for a one-story branch plant at Ypsilanti, Mich., to cost over $100,000. Albert Kahn, Inc., Marquette Building, Detroit, is architect.

Simplex Paper Co., Adrian, Mich., manufacturer of corrugated boards, chip boards, etc., has work under way on a one-story addition to mill at Palmyra, Mich., for production of strawboard specialties, to cost close to $30,000 with machinery.

Alaska Refrigerator Co., Muskegon, Mich., manufacturer of refrigerators and refrigerating equipment, is considering addition to plant, including improvements in present factory, to cost over $35,000 with equipment.

Murray Corpn. of America, Inc., Ecorse, Mich., manufacturer of automobile bodies, metal stampings, etc., has awarded contract to Whitehead & Kales Co., 58 Haltiner Street, River Rouge, Mich., for superstructure for two one-story additions, 80 x 260 ft. and 60 x 160 ft., to cost over $100,000 with equipment. Structures will be used for production of heavy metal stampings. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Board of Trustees, Michigan State College, East Lansing, Mich., has plans for a two-story addition to engineering school, to cost about $40,000 with equipment. Bowd & Munson, Lansing, are architects.

City Council, Wyandotte, Mich., will receive bids on general contract until Oct. 7 for an addition to municipal electric light and power plant, to cost about $300,000 with machinery, including improvements in present station. Froehlich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is engineer.

Eau Claire Farmers' Exchange, Eau Claire, Mich., has awarded a general contract to Joel Pearson, Benton Harbor, Mich., for a one-story fruit-packing plant to cost close to $25,000, including conveying and other equipment. Homer Harper, Benton Harbor, is architect.

Common Council, Cassopolis, Mich., is

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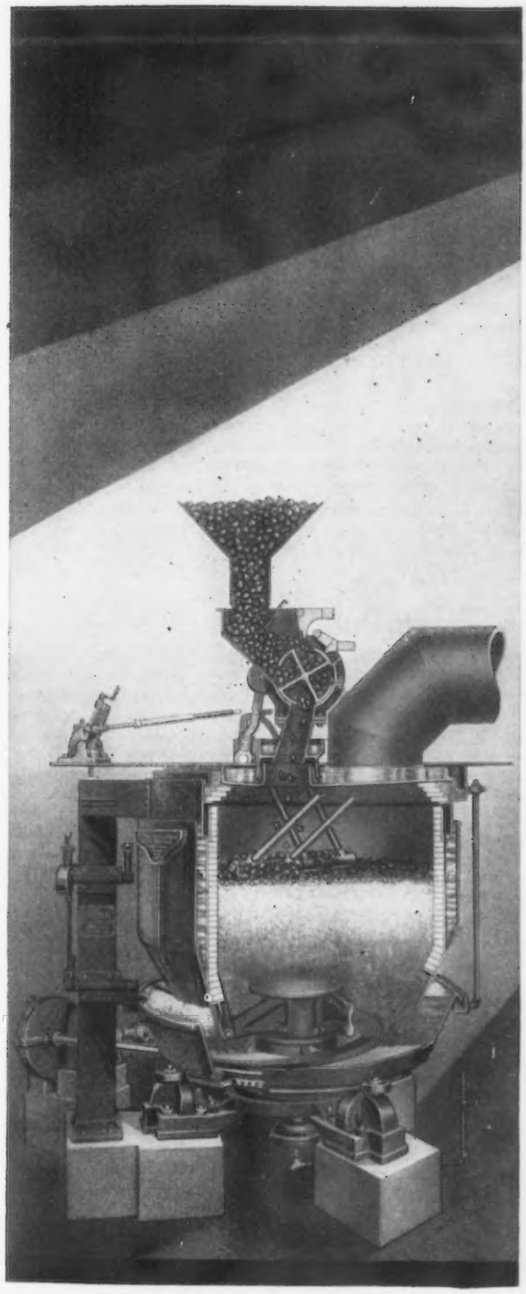

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planning a special election for approval of a bond issue of $50,000, proceeds to be used for installation of an electric light and power distributing system.

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Pacific Coast

PLANS are being completed by Department of Water and Power, 207 South Broadway, Los Angeles, for third unit of municipal hydroelectric power plant No. 2, San Francisquito Canyon, near Saugus, Cal., to provide for increase of 18,000 hp. in capacity, to cost $1,000,000.

William Richards, Architects Building, Los Angeles, has plans for a three-story automobile service, repair and garage building at 1207 South Grand Avenue, 100 x 150 ft., to cost about $100,000 with equipment.

St. Francis Ice Co., San Francisco, care of Carl S. Plaut, 1201 California Street, has leased building at Tenth and Bryant Streets and will remodel for new ice-manufacturing plant to cost about $60,000. Machinery will be electric-operated.

Swift & Co., Pacific and Davis Streets, San Francisco, meat packers, are planning to rebuild part of plant at Oakland, Cal., recently destroyed by fire, with loss of about $75,000 including equipment.

Imperial Ice & Development Co., Brawley, Cal., is planning an addition to ice-manufacturng plant to cost over $65,000 with machinery. Application has been made to city to close part of street to provide for new unit.

Puget Sound Power & Light Co., Seattle, is planning extensions and improvements in distributing station and power lines near Everett, Wash., to cost about $35,000. Company has secured permission to make modifications in construction of hydroelectric generating plant on Rock Island in Columbia River, for which power permit was issued several months ago. Entire project with steel tower transmission lines will cost about $15,000,000.

Gas-Ice Corpn. of Washington, Inc., 912 Northern Life Tower, Seattle, R. M. Newburn, president, is considering new plant near Goldendale, Wash., adjoining property of Northwestern Natural Gas Co., for manufacture of dry ice, to cost close to $100,000 with machinery. Natural gas will be used as fuel.

Banning Union High School District, Banning, Cal., has asked bids on general contract for one-story manual training shop, 44 x 99 ft., at high school group. Frank R. Schaefer, Kerckhoff Building, Los Angeles, is architect.

Municipal Power Department, Seattle, has arranged for a bond issue of $4,000,000, proceeds to be used for additional power development and extension in transmission lines.

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Foreign

FOLLOWING completion of plant for production of nitrates, now under way, to cost over $2,500,000, Soviet Russian Government, Moscow, is planning erection of a similar plant early next year near Moscow, to cost close to like sum. Government has engaged four former employees of Atmospheric Nitrogen Corpn., Hopewell, Va., including H. E. Spencer, previously superintendent at Solvay, N. Y., plant to supervise installation of equipment and give technical instruction. Amtorg Trading Corpn., 261 Fifth Avenue, New York, official buying agency has arranged details of work. Soviet Government is also planning construction of a pipe line from point in North Caucasus to Lisky, with branch line to Moscow, about 1750 miles, for oil service.

Mexican Eagle Oil Co., Mexico City, Mexico, has closed contract with International Petroleum Co., 39 Broadway, New York, for operation of latter's oil properties in Tampico section of Mexco, including development of new oil lands of International company in that district on royalty basis, with installation of equipment, pipe line facilities, etc.

Western Australia Match Co., Melbourne, Australia, affiliated with Federal Match Co. and Bryant & May, Melbourne and Sydney, has purchased property at West Perth, Australia, as site for new plant, initial units to cost over $200,000 with machinery.

Corn Products Refining Co., Mexico City, Mexico, with headquarters at 17 Battery Place, New York, is considering addition to plant at Aguas Calientes, Mexico, to cost over $175,000 with machinery.

Guipromach, Moscow branch of Soviet State Institute for Planning of Machine Building and Metal Working Plants, 21 Miasnitzkaia, Moscow, U. S. S. R., is interested in regularly receiving literature regarding new developments in machine tools, foundry equipment, heat-treating apparatus and metal-working equipment.

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Canada

TOWN COUNCIL, Mount Royal, Que., will call for bids about Nov. 1 for alterations and additions to power plant and electrical equipment. W. R. J. McNeil is engineer.

City of Verdun, Que., plans large expenditure on sewage plant additions and will soon be in market for pumps and other equipment. Aime Parent is secretary.

J. Peebles, mayor, Hamilton, Ont., is receiving bids until Sept. 23 for superstructure of waterworks pumping station. W. L. McFaul is engineer.

Feldman Auto Parts, Ltd., 6335 St. Lawrence Boulevard, Montreal, is contemplating erection of a manufacturing plant.

Bids will be called soon for second unit of steel plant for Dominion Bridge Co., Ltd., at Burnaby, B. C., to cost $100,000.

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New Trade Publications

Coal Pulverizers.—Fuller Lehigh Co., 85 Liberty Street, New York. Bulletin No. 906 describing and illustrating company's new type C pulverizer for use in small and medium-sized direct-fired boilers. Pulverizer is said to be especially adaptable to firing melting furnaces, core ovens, heating furnaces and similar applications.

Cements and Plastics.—Babcock & Wilcox Co., 85 Liberty Street, New York. Refractory cements and plastics and their uses and method of application are discussed in an illustrated bulletin. A discussion of the modern trend in refractory cements is included.

Chrome-Nickel Steel. — Allegheny Steel Co., Brackenridge, Pa. A 20-page booklet showing Allegheny metal installations. Included is an alphabetical list of installations in office buildings, universities and schools, restaurants, hospitals and other institutions, dining cars, stores, industrial cafeterias, food manufacturing plants, paper mills, dairies, laundries and residences.

Pickling Baskets. — Kirk & Blum Mfg. Co., 2850 Spring Grove Avenue, Cincinnati. Crates, baskets, lead and rubber-lined tanks, exhaust systems and other pickling equipment are illustrated in attractive folder.

Cutting Compound. — Sun Oil Co., Philadelphia. "Cutting and Grinding Facts," a 50 page booklet illustrating many machining and grinding applications aided by Sunoco emulsifying cutting oil. Proportions of water recommended and other engineering data are detailed in this booklet which is a second edition, considerably revised and amplified.

Spiral Welded Pipe.—American Rolling Mill Co., Middletown, Ohio. Engineering bulletin presents information in connection with designing pipe lines for pressure.

Ornamental Iron Work.—J. G. Braun Co., Inc., 537 West Thirty-Fifth Street, New York. Under the title "Good Practice in Ornamental Iron Work," the company, which carries a stock of steel moldings, ornaments and similar products, has begun to issue in a special portfolio, a series of measured details. The first set of drawings to scale deals with ornamental iron railings and stair rails, a marquise, store front and heating and ventilating grilles. Scale drawings of the necessary ornaments are shown, as well as drawings of the installations and necessary information. It is planned to issue additional sheets for the portfolio, giving general specifications for ornamental iron work and the required finishes and textures.

Metal Cleaning.—J. B. Ford Sales Co., Wyandotte, Mich. A 40-page booklet on "Wyandotte" cleaning compounds for all uses, including cleaning after heat treatment, before plating, burnishing, tumble barrel cleaning, before application of vitreous enamel, japanning, lacquering or painting and for removal of paint, lacquer enamel and japan on all kinds of metal. The booklet is illustrated with views of plants where the company's compounds are in use.

Immersion Heaters.—H. O. Swoboda, Inc., 3400 Forbes Street, Pittsburgh. "Falcon" bare electric immersion heating units and coating tanks, suitable for melting asphalts, tars, compounds, oils, varnishes and similar viscous materials which are electrical insulators, are described in bulletin No. 230, 8 pages.

Gears.—Earle Gear & Machine Co., 4707 Stenton Avenue, Philadelphia. Pocket-size catalog No. 31, 100 pages, contains a wealth of information concerning tooth shapes, gear sizes and formulas of value to users of gears of various types. The company's large sheaves, bridge operating machinery, cold metal saws, hand grinding and

R-E-A-D

Hamilton-Saagamo turned production of their vitreous enameled clock case over to G. P. & F. Result: a very beautiful case at a very interesting price.

HOW TO MEET THE INESCAPABLE CRY FOR LOWER PRICES

The voices of sales units and retailers everywhere are raised in a huge national chorus: "Give us lower-priced merchandise—bargains which even the hard-boiled prospect of today cannot resist."

In self-defense, no manufacturer can disregard that cry. G. P. & F. stampings have aided many manufacturers and may bring savings to you also. Perhaps *you* can get an idea from reading the following examples:

Cost Savings

A lower crankcase for automobile motor was stamped from 16 gauge steel by G. P. & F. at a cost of about one-half that of the former aluminum casting.

●

A carburetor manufacturer saved $5,000 on raw material alone on the first production schedule of 50,000 units—when he changed from cast brass shells to G. P. & F. drawn brass shells. The change saved 1½ lbs. of brass per unit. Later he changed to sheet steel, making still further savings.

●

A unit formerly cast was redesigned for G. P. & F. pressed-metal production. On 5,000 units, $500 was saved in machining costs and more than $1,000 in metal costs. The better finish and appearance of the pressed unit enabled the manufacturer to outsell competition at a profit.

●

A body for an automobile jack was formerly cast of aluminum. Now it is pressed by G. P. & F. from steel at a 50% saving plus a marked reduction in weight and an increase in strength. The aluminum casting weighed 14 ounces; the pressed steel body weighs only 10 ounces.

●

A 25% saving in material, an elimination of machining and assembling operations were achieved by using G. P. & F. stampings instead of castings in a built-up traffic-signal post.

Weight Savings

A pump manufacturer replaced a cast unit with a G. P. & F. drawn unit and saved 73 lbs. of metal per unit.

●

A business machine with its G. P. & F. pressed case weighs 12 lbs. less than it weighed with a cast enclosure.

●

On another business machine, a two-thirds reduction in weight was made by the change to G. P. & F. drawn covers.

●

An oil pan for a machine tool weighed 28 lbs. when cast, was heavy and brittle, and required grinding and buffing. The same pan made of G. P. & F. pressed steel weighs only 5 lbs., 14 ozs., stands vibration better, is stronger and requires no finishing.

●

If these hints suggest anything to you, send a sample or blueprint for quotations. First of all send for the valuable book *"In Harmony with Modern Progress"*.

●

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G.P.&F. STAMPINGS

Business as Others See It

Digest of Current Financial and Economic Opinion

OVERPREDICTION, rather than overproduction, has been suggested as one of our chief troubles. *Commerce and Finance* thinks that "many of the items in the week's news would seem to justify this slap at our prophetic instinct and mistakes."

Continued dependence upon conditions abroad is regarded by some observers as further retarding our improvement. As Harvard Economic Society puts it: "There is no indication in America that there will be any real change in the situation until European affairs are more settled. And until American industry becomes active, commodity prices are not likely to rise. . . . The Continent, England and America depend one on the other."

Prices Holding Up Better

Comparative wholesale price stability is hailed in several quarters as a heartening sign. *Annalist*, in particular, stresses this point. That paper reverts to its previous comment regarding the country's never having "been very prosperous when Ford was depressed, and conversely it has as a rule enjoyed prosperity when Ford has been active." Hence the enthusiasm greeting Ford's resumption.

A new angle is thrown on our situation by the *Annalist* theory that "partly the present depression has been caused by overproduction of transportation facilities"—mainly automotive. Not only have the railroads lost traffic, but the motor carriers have, also. Else, why the halving of truck output from a year ago, and the low quotations for shares of Mack and other truck producers?

Growing Up to Our Facilities

Such an overproduction of transportation facilities a half century ago we "got out of by the simple process of the country's growing up to the enlarged facilities. And that is the process by which we shall emerge from the present depression. And growing up to our present overcapacity is much simpler than in the earlier periods. Whereas excess railroad mileage [then] had either to be used or abandoned, the excess plant facilities which we undoubtedly possess [now] for the manufacture of automobiles can be eliminated, in part at least, by turning some of it over to other industries."

Improvement in the general situation is looked for by *Business Week* to carry forward "until the cacophony of the coming Congress fills the atmosphere early in December." That paper looks upon a drastic increase in Federal income tax schedules as inevitable. Meantime, its index of business activity has advanced to 72.5 from 71 at end of August.

Political Spending Begets Taxation

Spending of huge sums for unemployment relief—either in providing work or in "doles"—is viewed by *Financial Chronicle* as in the offing and much to be deplored. "On every side," that paper says, "the country is being confronted with schemes for spending money on a huge scale, for incurring debt and for increasing taxation, all intended for relieving unemployment and for aiding in the attempt to bring about trade revival; while the very effect of the proposals, by reason of their fantastic character and the huge drafts on Government revenues from the public treasury which they involve, is further to retard that revival of trade which every one is so earnestly and so urgently seeking."

Among the agencies looking across the waters with unmixed apprehension is the American Federation of Labor. In its "Survey of Business" for Sept. 12 is the remark: "Business at home is under the shadow of catastrophes abroad. The September upturn has been delayed, and forecasters now believe that revival will not begin this autumn."

beveling machinery and special equipment are illustrated also.

Temperature and Pressure Instruments.—C. J. Tagliabue Mfg. Co., Park and Nostrand Avenues, Brooklyn, N. Y. General catalog devotes more than 100 pages to instruments for indicating, recording and controlling temperature and pressure in industrial processes, including the complete line of TAG controllers, recorders, dials, thermometers, hydrometers, oil testers and moisture meters. These are grouped into appropriate classifications and presented with useful engineering information.

Marine Motors.—Auto Engine Works, 349 North Hamline Avenue, St. Paul, Minn. Two bulletins illustrate "Capitol" conversions of Liberty-12 and Wright "Tornado" aircraft engines for speed boats, fast runabouts and cruisers.

Precision Borer.—Société Genevoise d'Instruments de Physique, Geneva, Switzerland; R. Y. Ferner Co., Investment Building, Washington, D. C., American representative. Eight page catalog No. 534 describes type MP-3C "SIP" precision machine for locating, drilling, boring and checking jigs and other work. New features of the unit include drive by vertically mounted motor, increased height below the cross rail and greater range of boring and drilling speeds. Pieces 12 x 18 in. can be bored at one setting.

Metal Lacquer.—E. I. DuPont de Nemours & Co., Wilmington, Del. Booklet, 19 pages, "A Clear Lacquer for Metal Protection," illustrates and describes a number of scientific tests incident to developing a new metal lacquer, for which a number of advantages are claimed.

Stainless [Rustless] Steel.—Republic Steel Corpn., Massillon, Ohio. Leaflet describing Enduro FC stainless [rustless] steel, an alloy combining qualities of Bessemer screw stock with corrosion and heat-resisting properties.

Welders and Threaders. — Bonney Forge & Tool Works, Allentown, Pa. Illustrated booklet, describing patented fittings for making joints by welding to the main line, using a fusion or V-weld, removing the button and completing the junction by welding or screwing the branch pipe to the fitting outlet.

Foundry Equipment.—General Electric Co., Schenectady, N. Y. Fifty-page booklet describes and illustrates electric equipment for the foundry, including air compressors, heating equipment, motors, arc welders, control devices, electric locomotives and X-ray equipment.

Hand Trucks.—Illinois Iron & Bolt Co., Carpentersville, Ill. Illustrated folder presents features of a small, steel hand truck for handling merchandise up to 400 lb.

Wire Rope and Wire. — John A. Roebling's Sons Co., Trenton, N. J. Latest edition of company's catalog, 279 pages, attractively bound, covering lists of wire products, with prices. Combined tables of sizes and weights in the principal wire gages are given.

Controller Equipment. — General Electric Co., Schenectady, N. Y. Descriptive folder presents G-E controllers, stressing modernized features of the equipment.

Stock Drives. — Morse Chain Co., Ithaca, N. Y. Illustrated catalog, 48 pages, giving data, tables of horsepowers, prices, etc., on stock drives up to 50 hp.

Water-Conditioning Equipment.—Elgin Softener Corpn., Elgin, Ill. Folder describes and illustrates blowing-down apparatus for controlling boiler blow-down and means of reclaiming and utilizing the heat of the blow-down.

Annealing Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Leaflet 317 describes a continuous, clean annealing furnace of the conveyor type, adaptable to a wide range of operations for annealing punchings, stampings, forgings and light castings on a production basis.

Woven-Wire Fabrics.—John A. Roebling's Sons Co., Trenton, N. J. Illustrated catalog, 72 pages, with prices and specifications of all types of wire-cloth products made by the company.